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COLLEGE OF HEALTH SCIENCES

SCHOOL OF NURSING AND MIDWIFERY

ONCOLOGY NURSING PROGRAM

PREVALENCE OF FATIGUE AND ASSOCIATED FACTORS AMONG CANCER PATIENTS ATTENDING TIKUR ANBESSA SPECIALZED HOSPITAL, ADDIS ABABA, ETHIOPIA, 2019.

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A RESEARCH THESIS SUBMITTED TO SCHOOL OF NURSING AND MIDWIFERY COLLEGE OF HEALTH SCIENCES ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR MASTER OF SCIENCE DEGREE IN ONCOLOGY NURSING.

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APPROVAL SHEET

ADDS ABABA UNIVERSITY

COLLEGE HEALTH SCIENCE

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I, the undersigned MSc student, declare that I have submitted my original work on a title **prevalence of fatigue and associated factors among adult cancer patients at TASH, Addis Ababa, Ethiopia, 2019**, for the scientific, ethical and technical conduct of the thesis and for provision of the progress and for guidance by my advisors.

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STATEMENT OF DECLARATION

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every effort has been made to avoid plagiarism in the preparation of this thesis.

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LIST OF ACRONYMS AND ABBREVIATION

BCS	Breast Cancer Survivor
BFI	Brief Fatigue Inventory
CHS	College of Health Science
CLAS	Cancer Linear Analogue Scale
CRC	Colorectal Cancer
EAPC	European Association for Palliative Care
EORTC	European Organization for Research and Treatment of Cancer
FACT	Functional Assessment of Cancer Therapy Fatigue Scale
GLOBOCAN	Global Cancer Mortality and Incidence
NCCN	National Comprehensive Cancer Network
NCICT	National Cancer Institute Common Toxicity
QOL	Quality of Life
SPSS	Statistical Package for the Social Sciences
TASH	Tikur Anbessa Specialized Hospital

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ABSTRACT

Background: Fatigue is a common distressing problem in most cancer patients. It may be caused by the disease, the complications of the disease and its treatments. This study aimed to assess prevalence of fatigue and associated factors among adult cancer patients receiving various treatment. A cross sectional study was conducted on 278 patients from February 2019 to march 2019 in TASH Cancer Center. Brief Fatigue Inventory (BFI) scale was used for assessment of fatigue, other questions were concerning the socio-demographic data, medical condition and clinical factor included.

Objectives: was to assess the prevalence of fatigue and associated factors among cancer patients February and March 2019, at TASH in Addis Ababa, Ethiopia.

Methods: A cross-sectional study design was used among 278 randomly selected cancer patients undergoing cancer treatment at TASH. A standardized data collection tool, Brief Fatigue Inventory (BFI) was used to gather information from participants. The data was entered to EPI-data version 3.1 and transferred to SPSS version 24 for analysis. Bivariate and multivariable logistic regression were conducted to summarize the data. Level of confidence was determined at 95% CI and p-value <0.05 was considered significant for associations.

Result: The prevalence of fatigue among cancer patients in this study showed (74.8%). Age AOR=3.15[1.352-7.336], stage of cancer, AOR: 0.022, [0.0030-0.172], presence of infection, AOR: 4.153 [1.064-16.069], type of cancer AOR= 5.189 [1.590-16.9], and type of treatment AOR: 0.177 [0.068-0.46] showed significant association with fatigue.

Conclusion and Recommendation: The prevalence of fatigue among cancer patients undertaking cancer treatment in this study is high. Patients undergoing radiotherapy and chemotherapy demonstrated higher fatigue symptoms than the other treatment modalities. Age, stage of cancer, type of cancer, type of treatment and infection were associated with fatigue. Therefore, especially nurses and physician could be work on how to reduce fatigue at all levels of patient care.

The total cost of the study was 25000.09 ETH Birr.

Keywords: Fatigue prevalence, cancer patients.

CHAPTER ONE: INTRODUCTION

1.1 Background

Cancer now ranks as the leading cause of death globally (1) and it has a great impact on affected person. The number of global cases of cancer is projected to increase 65% from 12.7 million in 2008 to 21 million in 2030 (2). Similarly, Cancer (CA) is an increasing public health burden for Sub Saharan Africa at large. In Ethiopia, Hospital records show that there are more than 150,000 cancer cases per year and currently cancer accounts for 4% of all deaths (3).

According to European Association for Palliative Care (EAPC) fatigue defined as "a subjective feeling of tiredness, weakness or lack of energy"(4) while the National Comprehensive Cancer Network (NCCN) as "a persistent, subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning"(5-7). In contrast to the tiredness sometimes felt by a healthy individual, fatigue in cancer patients is perceived as being of greater magnitude, disproportionate to activity or exertion, and not relieved by rest (8).

Fatigue in cancer patients is seven times more prevalent than fatigue in the normal population (14% vs 78%) (9). In addition to the direct impact from cancer, various treatment modalities, particularly chemotherapy and radiation, are known to cause fatigue for many patients for an extended period of time(10).

Globally, estimated 50%-90% of the cancer patients experiences the difficulties of fatigue, the later number resemble to the patient subjective to chemotherapy and radiotherapy (11). Fatigue is now understood to be the most common symptom associated with cancer and its treatment(10, 12). It is also under estimated symptom in cancer patients (13, 14). The causes are multifactorial such as cancer itself, cancer treatment, opioids, anxiety medication effect (15, 16).

With the continued development of cancer diagnostic and therapeutic technologies, patient survival duration has been significantly extended. However, fatigue related to treatment cancer can have a major negative impact on quality of life by altering a person's ability to engage in meaningful personal, work, and social activities. As a result, improvements in the quality of life of cancer patients have fallen (10, 17, 18). But it can be treatable if provided proper care (19). Fatigue occurs most often after surgery, chemotherapy, radiotherapy and cancer patients report

it as the major obstacle to normal functioning(12, 14) and a good quality of life (20). Differences in the incidence and severity of fatigue have been noted by age, gender, stage of disease, and functional ability. These differences should be interpreted with caution because the effects of different types of disease and treatment protocols on the incidence and severity of fatigue are unknown (21)

1.2 Statement of problem

The global side effect burden score takes in to account twelve side effects commonly experienced by cancer patients during and following treatments; fatigue is ranked next to pain (22). Fatigue is a pervasive and vexing problem in individuals with cancer (23, 24). With a prevalence rate 25%- 99% in many studies (12, 25-27), and majority of reports estimate that approximately one-third of cancer survivors experience fatigue (28).

It has been found to be a problem before, during, and after treatment, sometimes continuing long after treatment has ended, even in those believed to be disease-free. Fatigue in cancer patients has been reported 90% of patients treated with radiation, and 80% of those under chemotherapy treatment (10, 29). It affects physical, social, cognitive, emotional life of the patients and their families; however, it remains under-recognized and undertreated problem in cancer survivor (6, 30).

Fatigue the foremost complain from majority of patients (31). Yet, the cause is not fully understood. Fatigue can arise from the cancer itself, from a treatment, or from a variety of malignancy associated concurrent syndrome (4), and it may be influenced by demographic, psychosocial, and behavioral conditions (32). It is the most prevalent symptoms in both chemotherapy and radiation therapy (33).

Fatigue management strategies tend to focus on both non-pharmacological and pharmacological (34). Non pharmacological treatment accounts patient/family education and counselling, physical activities, behavioral intervention, psycho stimulants, and a care for contributing factors such as pain, emotional distress, sleep disturbance, nausea/vomiting , lack of appetite and anemia (35-37). Unlike other symptom treatment fatigue require a general supportive care developed by the NCCN and the oncology of nursing society(35). Nevertheless, knowledge about this condition remains fragmentary and scarce (38).

Until recently, Fatigue is infrequently discussed or treated, because fatigue is considered an unavoidable symptom, to be endured rather than treated. In addition to this, health care professionals focus on other symptoms, such as pain, nausea, and vomiting. These may be the reason why the patients stop their treatment schedule or disappoint and refuse to go for next follow-up due to fatigue (10, 39). Even if there was a study done in South Africa showed that about 80% of cancer patient experienced with fatigue(40). However, Cancer is still a challenge

for low- and middle-income countries. This is due to limited information in Ethiopia related to prevalence fatigue. Therefor in order to fill this gap this study tried to determine the prevalence of fatigue and associated factor in cancer patients at TASH, Addis Ababa, Ethiopia.

1.3 Significance of the study

Fatigue is a known major problem in cancer survivor. The prevalence of fatigue varies in cancer patients from 25% -99% (32, 41, 42). And also, it has a serious impact on patient's social relationships, mood, work, daily activities and a significant impairment in overall quality of life. Despite this, Fatigue is underreported, underdiagnosed, and undertreated ,even in some cases might lead to treatment discontinuation(6, 43).

The finding of this study will be important for health care practitioner and other responsible bodies, particularly for nurses it is very important for them to assess and manage fatigue related to cancer and its treatment since they are closer to the patient and treat patients holistically in majority of time. On the other hand, Fatigue is not included in nursing care plan format, the reason maybe they did not give an attention for fatigues intervene by professionals. Based on this finding, policy makers will incorporate fatigue as one component, to assess and intervene it accordingly.

Our patient is being informed on the other commonest symptoms like pain, nausea and vomiting. However, lack of awareness on symptom fatigue are not clearly known. Hence, this symptom may increase disease burden and reduce quality of life in cancer patient. This study will be providing a base line information for policy makers, program planner, volunteers, and future researcher who are interested in conducting study on this topic.

CHAPTER TWO: LITERATURE REVIEWS

2.1 Introduction

Fatigue one of the most frequently anticipated adverse effects of cancer treatment; as shown that 95% of patients who receive chemotherapy or radiotherapy expect to experience some degree of fatigue during their treatment(44).and has been growing over the past few decades.

2.2 Prevalence of fatigue

A cross-sectional study in Canada university health network, the proportion of participants with significant fatigue was higher in the breast 40 % and colorectal 33 % cancer patients compared with the prostate cancer 17% patients (45). Another cross sectional study was done in India showed that the most prevalent Fatigue was genitourinary cancer (28.6%), followed by breast cancer (21.4%) and head and neck cancer (18.3%) (46). In USA a study showed Variation in reported rates appears to be related to the type of cancer, treatments, Fatigue during treatment have been reported to vary from 37% to 78% for patients with lung cancer, from 28% to 91% for those with breast cancer, and as low as 15% for patients with prostate cancer(44).

A descriptive cross-sectional study in University of California, USA the prevalence of moderate or severe fatigue was higher (79%) in evening and lower (48%) in morning in breast and lung cancer patients receiving either chemotherapy or RT (47). The randomized controlled trials study conducted in the university of Alabama at cancer center of the 183 participants of African American 38% reported a moderate level [4-6] of fatigue, 62% reported a severe level [7-10] of fatigue (48). A cross-sectional study in Japan, the results showed that moderate or severe Fatigue was found in a high percentage of patients (59.5%) (49).a prospective study conducted in Bangalore India the prevalence of fatigue was 87.8%(50).

A descriptive cross-sectional survey conducted among 498 Jordanian cancer patients the most prevalent symptom reported by patients is fatigue 92%(51). Similarly a cross-sectional study was done in Malwa, a total of 126 patients diagnosed with cancer, including 46 males and 80 females, 83.3% of patients experienced fatigue(46). A study which is conducted in Germany showed that 48% has a symptom of Fatigue two years after completing their initial treatment and Studies in other countries have yielded comparable findings (52). Another cross-sectional study conducted in Italy with Fatigue is reported by 20–50% of patients after the end of therapy (53). An institution based cross-sectional study conducted in university of Texas in breast

cancer during radiotherapy, chemotherapy, and the prevalence Fatigue is estimated 25%-99% (54). Similarly a cross-sectional study conducted in USA Thomas university, Istanbul University the occurrence of cancer therapy-related fatigue vary from 30% to 91% in patients receiving chemotherapy and patients receiving radiation therapy(55). Anther similarly cross sectional study conducted in Istanbul Turkey the fatigue prevalence was 70%(56).

In Poland Medical University observational study report that 58–94% of patients with breast cancer experience Fatigue during treatment(57). In Norway fatigue reported in 53% of the women treated for gynecological cancers (58). Most of the studies examined the prevalence of fatigue among breast cancer patients they found that about (99 %) of patients were experienced some level of fatigue during the course of chemotherapy treatment and more than (60%) were rated their level of fatigue as moderate to severe (59). Similarly in Africa A Survey conducted in university of Johannesburg South Africa the participant breast cancer patients of 129 most received with multimodal treatment the findings revealed that as many as 80% of the participant experienced fatigue (60).

2.3 Factors Associated with Fatigue

2.3.1 Sociodemographic characteristic associated with fatigue

The study on fatigue impact on patient quality of life conducted at Jefferson College of Nursing USA showed that demographic factors such as marital status and level of income have been linked to related fatigue, with unmarried patients with a lower household income reporting higher levels of fatigue(32). Similarly In Iran Guilan University of Medical Sciences the results showed that the variable of unemployment was significantly associated with factors influencing treatment-related fatigue ($p = 0.034$)(61).

Another study in USA on Cancer-related fatigue has been shown to have a significant effect on employment and financial status(44). In contrast A prospective study conducted in Netherland hospital to examine the relation demographic and fatigue severity among women who received chemotherapy and radiotherapy there were no significant relationship between demographic and severity fatigue (62). A study on association between fatigue and other cancer related symptom found no univariate association between fatigue score and gender, ethnicity($p=0.31$)(63). Similarly In Northern Ireland and China Cancer Center study reported no relationship between age, gender, ethnicity(12, 64).

Age is considered predictive factor through the evidence is conflicting. A study done fatigue in cancer men over 75 years of age were found to experience 11 times more fatigue than their younger counterpart(65). In contrast In China University of Fudan, patients younger than 58 years clinically significant fatigue (17). Another study conducted in a university Hospital in Germany younger patients experienced fatigue than older patients using the age- and gender-adjusted, Men were less likely to be classified as fatigued than women. the prevalence of fatigue was 28% among men and 39% among women(66)

2.3.2 Medical condition associated with fatigue

A study conducted in Finland Problems associated with fatigue may be the result of the cancer itself, its treatments and infections(67). A study conducted at Wilmot cancer center New York. Anemia (a hemoglobin level of <12 g/dl) is one of the treatable factors that may contribute to CRF. On average, over one third of patients become anemic after three cycles of chemotherapy(68). Fatigue is commonly associated with other chronic illnesses such as heart failure, chronic obstructive pulmonary disease HIV/AIDS, end stage renal disease the prevalence is estimated to be in the range of 47-99%(65).

2.3.3 Clinical factor associated with fatigue

The study conducted in China Medical College of Soochow University showed that higher clinical stage ($p < .01$) were significantly associated with an increasing prevalence of fatigue (17); similarly Meta Analyses study conducted Academic at Medical Center in Netherland patients with stage II or III cancer, and patients treated with chemotherapy were at higher risk for severe fatigue than survivors with stage 0 or I cancer and with treated chemotherapy(69). in contrast In Netherland comprehensive cancer center a longitudinal study conducted in colorectal cancer shows that disease stage were not related to Fatigue over time(70).

A University of Western Ontario, Canada The level of fatigue increased significantly with more chemotherapy cycles(71); similarly In Brazil oncology and hematology one study showed in breast cancer Patients when measure with BFI score increase at least one point after the first cycle of chemotherapy(72);In contrast a prospective cohort study Department of Internal Medicine Netherland significant increase in fatigue was only seen during the first cycles of chemotherapy(73).

In Sweden department of oncology showed chemotherapy-induced anemia in adults reported that the highest anemia rates arose in patients with lung, gynecological, and genitourinary tumors, with incidences of 50%–60%(5); similarly A retrospective assessment conducted at Beth Israel Medical Center and St. Luke's Roosevelt Hospital Center and Durham Washington, for patients with breast, prostate, colorectal, lung and bronchus, and uterine-cervix cancers, the percentage experiencing anemia increased during the course of radiotherapy with incidence 67%(74, 75).

2.4. Conceptual framework

The conceptual frame work for this study which has been developed based on literatures. These groups of variables are used to examine factors associated with prevalence of fatigue among cancer patients. The frame work includes Socio demographic factors, clinical factor, comorbidity.

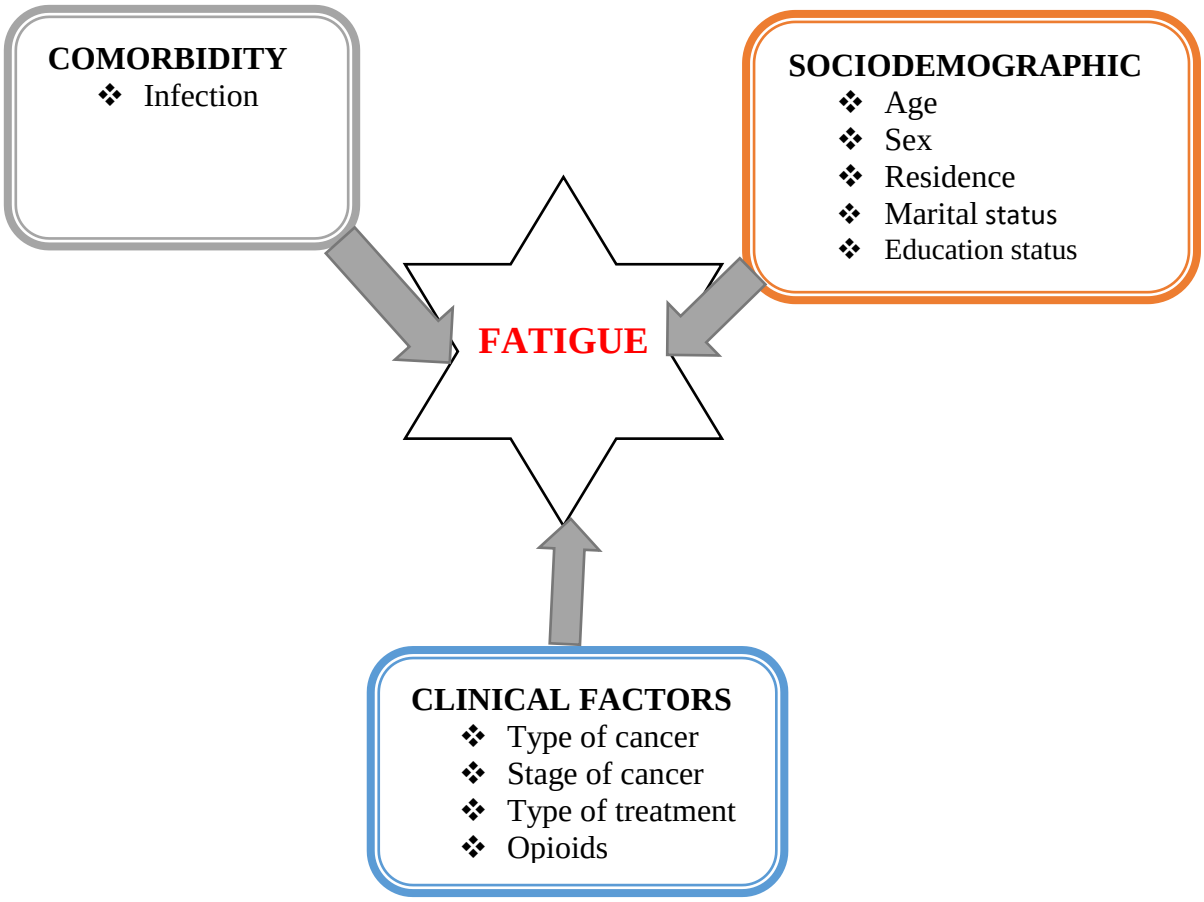

Figure 1: Conceptual framework developed from different literatures.(10, 32, 76).

CHAPTER THREE -OBJECTIVES

3.1 General Objective

To assess the prevalence of fatigue and associated factors among cancer patients attending at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2019.

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3.2 Specific Objectives

To determine the prevalence of fatigue in cancer patents in TASH.

To identify factors associated with fatigue among cancer patients in TASH.

CHAPTER FOUR - METHODS

4.1 Study area and period

The study was conducted at the oncology clinic of Tikur Anbessa Specialized Hospital (TASH), College of Health Sciences, Addis Ababa University, Ethiopia. TASH is a tertiary teaching hospital with 700 beds and give service for about 370,000 to 400,000 patients per year. The oncology unit giving service for more than 60,000 cancer patients annually and has an outpatient, in-patient (33beds), radiotherapy, chemotherapy and surgery care service. There are 6 senior oncologists, 25 residents and 30 nurses and 6 oncology nurses and 8 pharmacists, radiologist 5, medical physicist 4 working in the unit. The study was conducted from February to March 2019 at the oncology unit of TASH, College of Health Sciences, Addis Ababa University, Ethiopia.

4.2 Study Design

- Institutional based cross-sectional study was conducted.

4.3 Source population

- All adult cancer patients attending TASH

4.4 Study Population

- All adult cancer patients attending oncology unit of TASH during the study period.

4.5 Eligibility Criteria

4.5.1 Inclusion Criteria

- Diagnosed with cancer and ongoing of treatment
- Age >18years

4.5.2 Exclusion Criteria

- Patients excluded from the study if, they were not willing to participate

4.6 Sample Size determination

Sample size was calculated using single population proportion formula, assuming p=0.5 since there is no similar study in the area during literature search.

$N = \frac{(Z\alpha/2)^2 P(1-P)}{d^2}$ = 1.96 at CI of 95%

$n = \frac{(1.96)^2 0.5(1-0.5)}{}$

$(0.05)^2$

n= 384

Since flow of patients during data collection period is less than 10,000 then correction formulas will be applied. NF= $\frac{n}{1+\frac{n}{N}}$= $\frac{384}{1+\frac{384}{750}}$ = 253 NF= desired sample size

n= the calculated sample size N= total population

After adding 10% non-response rate the final sample size was **278.**

4.7 Sampling Technique

Tikur Anbesa Specialized Hospital (TASH) is selected for this study because it is the only public Hospital treating cancer patients from all over the country. From the oncology unit of TASH patients who can fulfill the criteria was identified from their charts each day.

According to the one-year record of adult receiving chemo therapy treatment cancer, 9000 cases were seen in the oncology unit at Tikur Anbessa Specialized Hospital (TASH). Since the duration of the study was four weeks, the calculated flow within the study period is 278 and the required sample size was 750 that come for treatment during data collection period was asked. Based on systematic random sampling technique every 3 participants was enrolled in the study during data collection period.

4.8 Variables of the study

4.8.1 Dependent Variables

- Fatigue

4.8.2 Independent Variables

- Socio demographic characteristics: - Age, sex, marital status, educational level, employment status.
- Clinical factor: Type of cancer, stage of cancer, type of treatment (chemotherapy radiotherapy, surgery or in combination), opioids,
- Medical condition: infection.

4.9. Operational definition

- Fatigue is a distressing, persistent, subjective sense of physical, emotional and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is disproportional to recent activity and interferes with the usual functioning.

- Fatigue was categorized using the Brief Fatigue Inventory: no fatigue [0], mild fatigue [1-3] moderate fatigue [4-6] and sever fatigue [4-10]. law fatigue [0-3] and high fatigue [4-10]

4.10 Data Collection Tools and Procedures

A standard BFI questionnaire was used to collect the required data. It has two parts, the first contained patient socio demographic information and the second part contained validated BFI scale questionnaire. The BFI was adapted by reviewing literature of similar studies aiming on the prevalence and its associated factors of cancer patients. The questionnaire was administered in the form of exit interview. Privacy was maintained and confidentiality of information was assured. Three BSC nurses and one supervisor was recruited to administer the interview.

4.11 Data Quality Control

Training was given for interviewers about techniques and the concept of questionnaire before data collection. Moreover, the instrument was pretested in 5% of the total sample size and pretested subjects were excluded from the actual data collection. During the process of data collection, the supervisor was overseeing the overall activity and check completeness and consistency of the data.

4.12 Data Analysis

The collected data was cleaned, checked, edited and entered to Epi data version 3.1, software. Then it was exported to SPSS version 24 for analysis. During process of analysis frequency distribution and percentage of different variables was computed to describe and summarize the basic socio demographic characteristics of the respondents. Binary logistic regression was run to determine the COR and those variables with P-value less than 0.25 was run for multivariate. Statistical significance and strength of association between dependent and independent variable was declared at P-value less than 0.05 and odds ratio at 95% confidence interval respectively. Result was described in text, frequency table and figures.

4.13 Ethical Consideration

the Ethical approval sheet was obtained from School of Nursing and Midwifery. Written consent was sought from eligible study participants. Information was given to study

participants and informed about their full right whether to participate in the study or not. To ensure confidentiality, anonymity was explained clearly to the study participants.

4.14 Dissemination of the Result

The study result will be presented to Addis Ababa University College of Health Science School of Nursing and Midwifery and it will be disseminated to Federal Ministry of Health (FMoH), policy makers, to studied heath institution (TASH). Furthermore, the paper will be presented on workshops and seminars. Finally, this study will be published in the reputable journals.

CHAPTER FIVE. RESULTS

5.1 Sociodemographic characteristics of adult cancer patients

From total of two hundred seventy-eight respondents124(45%) male and 154(55%) female participated. The mean age of the participant was 44.9 ± SD 14, median age of the participant was 45. Of the total study participant about 55% live in urban and 45% at rural. Table 1

Table 1: Socio-demographic characteristics among adult cancer patients receiving treatment in TASH, Addis Ababa, Ethiopia, 2019 (n=278)

Variable	Category	Frequency	Percent %
	20-40	102	37%
AGE	40-60	137	49%
	>60	39	14%
SEX	Male	124	45%
	Female	154	55%
MARITAL STATUS	Married	214	77%
	Single	49	18%
	Divorce	14	5%
	Widowed	1	4%
RESIDENCE	Urban	153	55%
	Rural	125	45%
EDUCATIONAL	No education	108	39%
LEVEL	Primary	36	13%
	Secondary	68	25%
	>Secondary	66	24%
OCCUPATION	Government	51	18.3%
	Private	51	18.3%
	House wife	77	27.7%
	Student	29	10.4%
	Merchant	21	7.6%
	Farmer	45	16.2%
	Retired	3	1.1%
	Others	1	.4%
MONTHLY	<500	94	34%
INCOME	500-1000	84	30%
	1100-2000	67	24%
	>2000	33	12%
MEDICAL	Payed	11	4%
PAYMENT	Free	267	96%
ADMISSION	New	11	4%
	Repeated	267	96

5.2 Medical characteristics among adult cancer patients

Medical characteristics of the respondents are found in Table 2. From the total of two hundred seventy-eight All the participants received treatment in the form of either chemotherapy, radiation, surgery or in combination. Cervical cancer (29.5%), breast cancer (24.5%) and radiation therapy (55.4%), chemotherapy (29%).

Table 2: Medical characteristics adult cancer patients receiving treatment in TASH, Addis Ababa, Ethiopia,2019. (n=278)

Variables	Frequency	Percent (%)
STAGE OF CANCER		
Stage **I**	11	4%
Stage **II**	58	21%
Stage **III**	114	41%
Stage **IV**	95	34%
TYPE OF CANCER		
Colorectal cancer	37	13.3%
Breast cancer	68	24.5%
Cervical cancer	82	29.5%
Rectal cancer	20	7.2%
Esophageal cancer	16	5.8%
Colon cancer	25	9%
Sarcoma	18	6.5%
Others	12	4.3%
TYPE OF TREATMENT		
Radiation therapy	154	55.4%
Chemotherapy	80	28.8%
Surgery	32	11.5%
Chemotherapy and radiation	5	1.8%
Chemotherapy and surgery	7	2.5%
PRESENCE OF INFECTION		
Yes	50	18%
No	228	82%

Fatigue, which interferes with the daily routine activities of the patient. Among them, walking ability affected worst and relation with other people was least hindered. The effect of fatigue on daily routine activities is shown in figure 2 below.

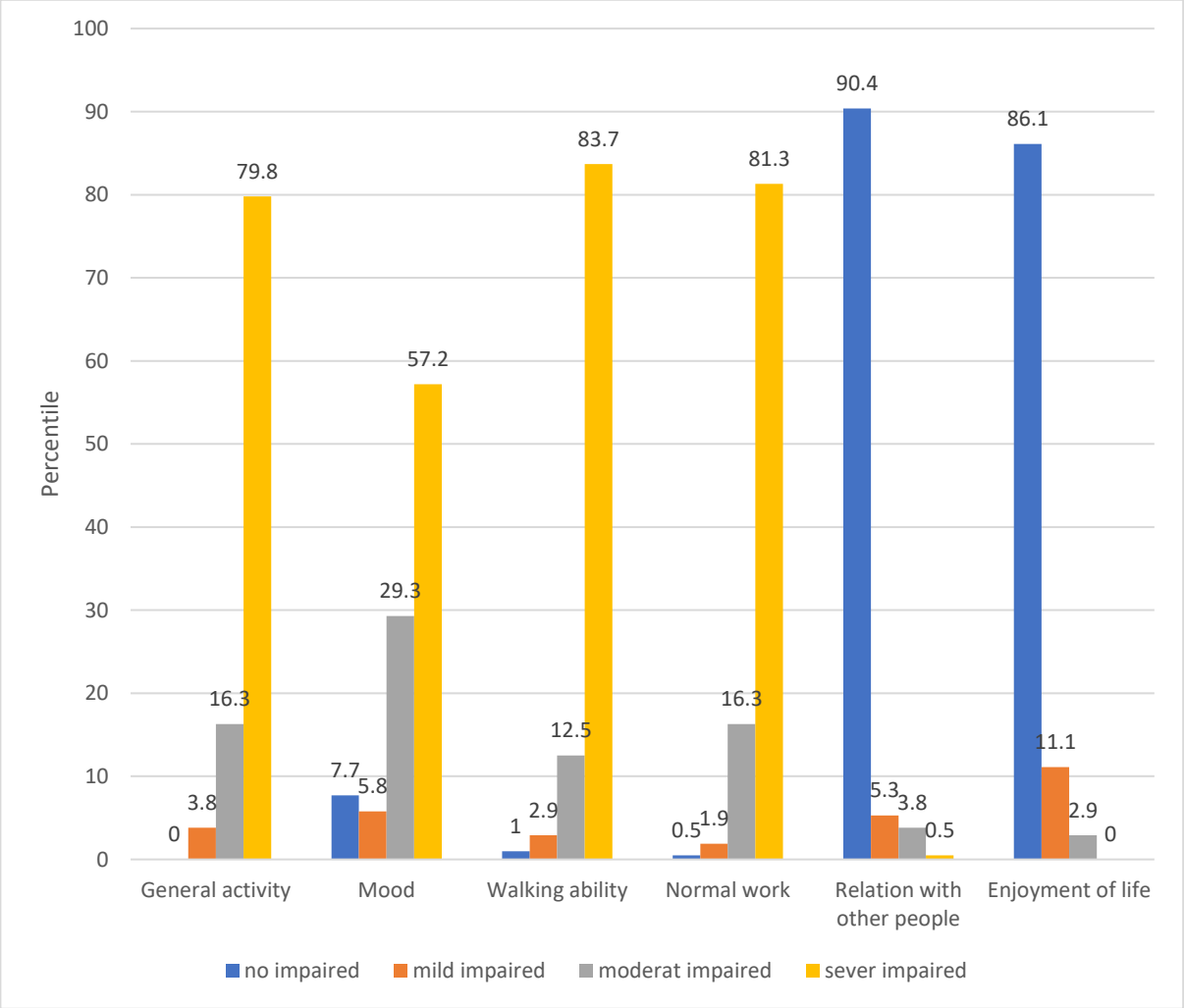

Figure 2: Effect of fatigue on normal activities of adult cancer patients in TASH, Addis Ababa, Ethiopia, 2019, (n=278).

5.3 prevalence of fatigue among cancer patients

The prevalence of fatigue among 278 cancer patients is,208(74.8%) (95%CI:70.1-80) based on the total BFI score ≥4 of the patients reported. Among those who reported fatigue, the mean score was 6.5(SD=2.9).

The prevalence of fatigue among cancer patients is,208(74.8%) (Fig 3)

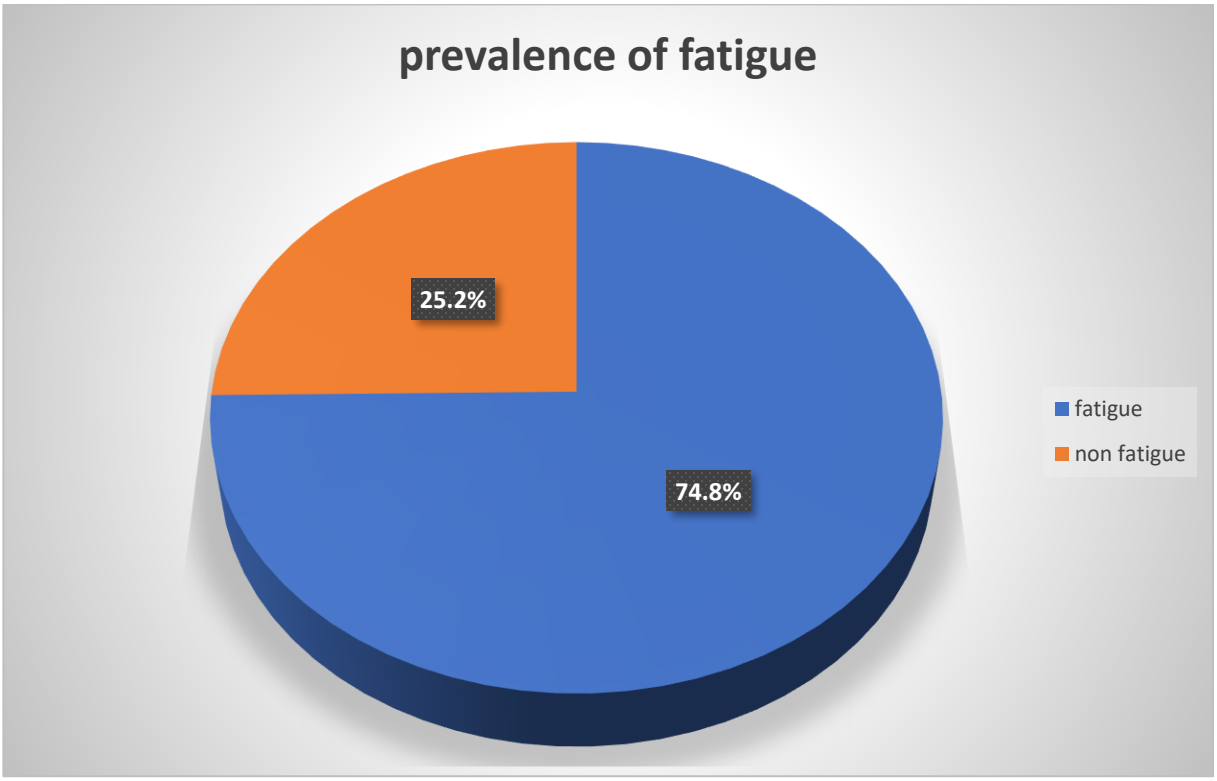

Figure 3: Prevalence of fatigue among adult cancer patients in TASH, Addis Ababa, Ethiopia, 2019, (n=278).

5.4 Factors associated with fatigue

5.4.1 Bivariate logistic regression

Out of twenty-six independent variables, seven variables namely age, level of education, address, type of cancer, stage of cancer, type of treatment, presence of infection had showed association in bivariate analysis with p-value less than 0.25.

5.4.2 Multivariable logistic regression

Then seven-variables controlling all factors were entered in the multivariable logistic regression analysis simultaneously. Age, stage cancer, presence of infection, type of cancer and type of treatment had shown significant association with p value, <0.05.

Accordingly, patients whose age from 41-60 years were 3 times more likely to have fatigue than those from age 20-40 years [AOR=3.15,95%CI;(1.352-7.336, P=0.008)].

The odds of developing fatigue among patients who had stage I cancer is 98%, stage II cancer 89% and stage III cancer is 84% less likely to have fatigue than patients with stage IV cancer [(AOR=0.022,95%CI:(0.0030-0.172), p<0.001], [(AOR=0.109,95%CI:(0.0300.397), p=0.001], [(AOR=0.160,95%CI: (0.048-0.535), p=0.003] respectively.

Furthermore, the odds of fatigue are 4 times more likely in cancer patient who had infection than cancer `patients with no infection [(AOR= 4.153, 95%CI: (1.064-16.069, p=0.002)].

On the other hand, the odds of fatigue were 5 times in breast cancer patients, 8 times in cervical cancer patients than patients with colorectal cancer [(AOR= 5.189,95% CI, (1.590-16.9) p= 0.006)], [(AOR= 8.269,95% CI, (2.234-30.610)], [(AOR=7.634,95% CI, (1.317-44.262) p=0.023)] respectively.

Finally, those who got treatment of chemotherapy 82%, surgery 87.4% and chemo and radiation 97.8% less likely than patients who got radiation therapy [(AOR=0.177,95%CI:(0.068-0.462) p=,0.001)], [(AOR=0.126,95%CI:(0.041-0.388) p<0.001], [AOR=0.021,95%CI:(0.002-0.287) p=0.004)] respectively

Table 3: Association factors among adult cancer patients undergoing treatment TASH, Addis Ababa ,2019 (n=278).

VARIABLE	FATIGUE				
	Non-fatigue N 70(%)	**Fatigue** N208 (%)	COR (95%CI)	AOR (95%CI)	P-v
AGE					
20-40	37(53)	65(31)		**1**	
41-60	21(30)	116(56)	3.144(1.69,5.81)	3.15(1.352,7.338)	.008*
>60	12(17)	27(13)	1.281(.581,2.82)	1.791(.577,5.558)	.313
RESIDENCE					
Urban	46(66)	107(51)	.553(.315,0.97)	.572(.119,2.747)	.485
Rural	24(34)	101(49)		**1**	
STAGE OF CANCER					
Stage I	9(13)	2(1)	.015(.003,0.85)	.022(.003,.172)	.000*
Stage II	20(29)	38(18)	.128(.048,0.344)	.109(.030,.397)	.001*
Stage III	35(50)	79(38)	.152(.061,0.381)	.160(.048,.535)	.003*
Stage IV	6(7)	89(43)		**1**	
PRESENCE OF INFECTION					
Yes	3(5)	47(23)	6.520(1.96,21.677)	4.135(1.064,16.069)	.040*
No	67(95)	16(77)			
TYPE OF CANCER					
Colorectal ca	19(27)	18(9)		**1**	
Breast ca	15(21)	53(25)	3.730(1.57,8.837)	5.189(1.590,16.935)	.006*
Cervical ca	12(17)	70(34)	6.157(2.53,14.98)	8.269(2.234,30.610)	.002*
Rectal ca	5(7)	15(7)	3.167(0.95,10.51)	3.092(.602,15.886)	.176
Esophageal ca	5(7)	11(5)	2.322(0.67,8.010)	2.290(.417,12.287)	.334
Colon ca	3(4)	22(11)	7.741(1.97,30.39)	7.634(1.317,44.262)	.023*
Sarcoma	7(1)	11(5)	1.659(0.52,5.218)	1.619(.315,8.317)	.564
Others	4(6)	8(4%	2.111(0.54,8.245)	3.075(.510,18.552)	.221
TYPE OF TREATMENT					
Radiotherapy	17(24)	137(68)		**1**	
Chemotherapy	31(44)	49(23)	.196(0.10,0.385)	.177(.068,.462)	.000*
Surgery	17(6)	15(21)	.109(0.046,0.258)	.1269(.041,.388)	.000*
Chemo &radiation	4(6)	1(1)	.031(0.003,0.294)	.021(.002,.287)	.004*
Chemo & surgery	1(1)	6(3)	.745(0.084,6.561)	1.454(.122,17.323)	.747

p- value <0.05

CHAPTER SIX. DISCUSSIONS

Fatigue is a highly prevalent and debilitating symptom experienced by most cancer patients during, and often for considerable periods after treatment. The recognition of the importance of fatigue to patients' psychosocial and cognitive functioning, as well as to their daily life.

Nearly 75% of the study participant had fatigue in the current study. Which is similar with study conducted in Netherland, and South Africa revealed that the rate of fatigue among adult cancer patients was 70%, and 80% (41,55) respectively. This similarity may be due to the fact that the pathophysiological characteristics of the disease by itself brings fatigue.

However, the magnitude of fatigue is higher than the result reported from Canada40%, Germany 48%, Italy 50% and Norway 53% respectively (42,48,49,53). This discrepancy could be due to the difference in socio economic status and health care delivery system. But, it is approximately similar with the study conducted in Alabama USA, Japan and Istanbul Turkey in which the rate of fatigue was 62%,59.5% and 70% respectively (45,46,53).

The magnitude of fatigue in the present study is lower than studies conducted in Malwa India, Bangalore India and Jordan USA which revealed that the rate of fatigue was 83.3%87%,92% (43,47,48) respectively. This inconsistency could be due to the different type of treatment and study area.

About 68% patients who received radiation therapy experienced fatigue in this study which is similar with study conducted in UK among patients receiving radiotherapy reported 65% (63). But lower in Rasht Iran (58.9%)(61).This could be due to different treatment modalities and heathy delivery system.

The prevalence of fatigue among cervical and breast cancer were 34% and25% respectively. This is nearly the same as the study conducted in India which showed as cervical cancer 28.6% and breast cancer (21.4%)(46).This similarity could be due to the relationship between the disease and its etiology(HPV for cervical cancer).

Breast and cervical cancer patients experienced fatigue about 5.189and 8.26 times more than colorectal cancer as a reference respectively. This may be due to physical image disability induced related stress burden and due to different treatment modalities. This result is supported by the studies conducted in Canada (42). This agreement might be due to study design and the

study tools. On the contrary study conducted in Durham Washington showed no association between cancer type and fatigue(75). This variation could be due to study design and advance of the disease or (stage of cancer during the study period).

This study showed that being older was more likely to have fatigue than younger patients [AOR=3.15,95%CI;(1.352-7.336)]. This is consistent with the study conducted in North Carolina(77).On the contrary the studies conducted in Germany and Korea indicted as younger age patients experienced fatigue more than older patients(78)(62).This inverse association could be due to different in living standard between the countries. On the other hand, the study conducted in Ireland and China indicated as there is no significant association between fatigue score and age of the patients (12,60). This could be due to study design and sample size.

The present study showed that type of cancer such as cervical cancer, breast cancer and colon cancer were significantly associated with fatigue [AOR=8.269,95% CI:(2.234,30.610)], [AOR=5.189, 95%CI:(1.590,16.935)], [AOR=7.634,95% CI (1.317,44.262)] respectively. This is in line with the study conducted in Tata Memorial Hospital India and California shows significant change in fatigue score was observed with type of cancer(79, 80).This association could be due to study design and study participants.

Patients who had stage III were 84% less likely to develop fatigue than stage IV as a reference. This finding in line with the study conducted in China, Sweden(17)(5). This association could be due to similarity of the study design and the fact of experiencing fatigue increases as the stage getting advanced. on contrary the study conducted in Netherland between the stage of cancer and fatigue score this variation related to type of cancer and type of treatment.

This study showed that higher stage patients had high score of fatigue which is similar with studies conducted in USA women breast cancer survivors with stage III and treated with chemotherapy were at higher risk for severe fatigue than survivors with stage I (61). This could be due to disease progress or extent of tumor bulky will affect the degree of fatigue.

In this study cancer patients with infection were 4.13 times more risk to experience fatigue than cancer patients without infection [(AOR= 4.153, 95%CI: (1.064-16.069]. This is similar with

the study conducted in Netherland, Finland, Switzerland (67).(61,(4) that states infection was significantly associated with fatigue among cancer patient.

CHAPTER SEVEN: STRENGTHS AND LIMITATIONS

7.1. Strength of the study

- Since the study was new in the study area it will provide useful information for the assessment and identification factors associated with fatigue.
- The sample of the study consisted of different types of cancer at different stages of the disease process.
- The sample size was large enough

7.2. Limitation of the study

- Being cross sectional study in nature, it does not tell us cause and effect.
- Comparison was also difficult due to limitation study in the country.
- As this study was a cross-sectional analysis, it could not be used to establish the exact pathophysiologic link between cancer related fatigue and subjective symptoms.

CHAPTER EIGHT: CONCLUSION AND RECOMMENDATIONS

8.1. Conclusion

The findings of this study indicated that the prevalence of fatigue in this study was high. Among cancer patients undertaking cancer treatment, fatigue was more prevalent in patients taking radiation therapy than the other treatment modalities. The increase in the prevalence of fatigue showed an increase interference in routine daily activities. Age, stage of cancer, type of cancer, type of treatment and presence of infection are associated with fatigue.

8.2. Recommendations

Based on the finding, the following recommendations could be made:

To TASH:

- Measure should be taken to early diagnose and treat cancer to prevent fatigue related to improve the quality of life of cancer patients.

To health care providers:

- Health care providers should create community awareness about cancer screening to reduce the complexity of the disease which may in turn result in fatigue reduction.

To Federal ministry of Health:

- Strengthening and expansion of cancer treatment center to help early diagnosis and treatment of cancer.

To researchers:

- Further studies exploring cause of fatigue among cancer patients undertaking cancer treatment may be necessary.

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10. ANNEXES

Annex I: English Version Information Sheet

Hello, my name is _____. I am working in college of health sciences, School of nursing and midwifery, Addis Ababa University and this study is for fulfillment masters in oncology nursing. I would like to ask you a few questions regarding your fatigue experience that are either associated with the cancer or the treatment your receiving using a tool called the Brief Fatigue Inventory (BFI). The interview would take a maximum of 5 minutes of your time. The purpose of this study is to assess the prevalence and associated factor of cancer related fatigue in cancer patients. Your participation is completely voluntary. You can refuse to answer any questions and/or withdraw from the study at any time without a problem to you or the services you get in the hospital. All your responses will remain strictly confidential: the hospital staff will not have access to your responses; your name will not appear on the interview and will not be recorded.

Are you volunteer to participate in the study?

1=Yes 2= No

If Yes, Continue to the Next Page

If No, Skip to the next Respondent

Annex II: Informed Consent Form (English Version)

Having the above information, I kindly ask you to take part in the study.

I undersigned will like to approve that, as I give my consent to participate in this study after detailed objective of the study have been explained to me in the language I understand. I have also understood that I can withdraw my consent any time without loss of any personal benefits.

1. If yes, continue to the following questions
2. If no, provide compliment, and skip to the next participant

Participant signature: _____ Date: _____

Name of data collector _____ Signature: _____ Date: _____

Please encircle the correct answer and write a correct number in the space provided, example age in years using pen (Blue).

Annex III: Questionnaire Form (English Version)

Questionnaire for data collection on prevalence and association factor of cancer related fatigue in cancer patients receiving care at ACSH, Mekelle, Ethiopia 2019

ID NO. _____

Annex I: Verbal consent form before conducting interview

Hello, my name is _____. I am working in college of health sciences, School of nursing and midwifery, Addis Ababa University and this study is for fulfillment masters in oncology nursing. I would like to ask you a few questions regarding your fatigue experience that are either associated with the cancer or the treatment your receiving using a tool called the Brief Fatigue Inventory (BFI). The interview would take a maximum of 5 minutes of your time. The purpose of this study is to assess the prevalence and associated factor of cancer related fatigue in cancer patients. Your participation is completely voluntary. You can refuse to answer any questions and/or withdraw from the study at any time without a problem to you or the services you get in the hospital. All your responses will remain strictly confidential: the hospital staff will not have access to your responses; your name will not appear on the interview and will not be recorded.

Are you volunteer to participate in the study?

1=Yes 2= No

If Yes, Continue to the Next Page

If No, Skip to the next Respondent

Socio-demographic and clinical characteristics of respondents

S. N	Questions	Choices	Skip
Section 1: Socio-demographic characteristics of respondents			
101	Gender	1. Male 2. Female	
102	Age years	----------	
103	Marital Status	1. Single 2.Married 3.Divorced 4.Widowed	
104	Level of Education	1. No education 2.primary school 3. secondary school 4. More than secondary	
105	occupation Status	1.Governmental employee 2. private employee 3.Merchant 4.Student 5.Farmer 6.House wife 7.Retired 8.Other, Please Specify _____	
106	Household income per capital	1.<500 birrs/month 2.500–1,000 birrs/month 3.1100–2,000 birrs/month 4. >2,000 birrs/month	

107	Medical payments	1.Self-pay 2.At public expense	
108	Religion	1.Orthodox 2.Muslim 3.Protestant 4.Catholic 5. Others, Please Specify	
109	Address	1.urban 2.rulal	
110	Admission type	1.New 2.Repeat	
Section 2: Medical Characteristics (to be filled through chart review by data collectors)			
201	Types of admission	1.Outpatient level 2.Inpatient level	
202	Primary Cancer Diagnosis	_____	
203	Current Cancer Stage	1.Stage I 2.Stage II 3.Stage III 4.Stage IV	
205	Presence of infection	1.yes 2.No	
206	Current type of anticancer treatment	1.Chemotherapy radiotherapy 2.Surgery 3.Chemotherapy 4.Radiotherapy 5.Hormonal therapy	
207	Use of opioids to treat pain	1.Yes 2.No	

208	Use of antiemetic	1.Yes 2.No	
210	Did you report to your physician as you feel fatigued?	1.Yes 2.No	If no q 210 go to q211
211	what are the possible reasons for not reporting?	----------	

Brief Fatigue Inventory

Date: _____ Time: _____

Name: _____

Last First Middle initial

Throughout our lives, most of us have times when we feel very tired or fatigued. Have you felt unusually tired or fatigued in the past week? Yes _____ No _____

1. Please rate your fatigue (weariness, tiredness) by circling the one number that best describes your **fatigue right now.**

0	1	2	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**
No fatigue										**As bad as you can imagine**

2. Please rate your fatigue (weariness, tiredness) by circling the one number that best describes your **usual** level of fatigue during the past 24 hours.

0	1	2	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**
No fatigue										**As bad as you can imagine**

3. Please rate your fatigue (weariness, tiredness) by circling the one number that best describes your **worst** level of fatigue during the past 24 hours.

0	1	2	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**
No fatigue										**As bad as you can imagine**

4. Circle the one number that describes how, during the past 24 hours, fatigue has interfered with your:

A. General activity

0	1	2	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Does not Interfere										Completely interferes

B. Mood

0	1	2	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Does not Interfere										Completely interferes

C. Walking ability

0	1	2	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Does not interferes										completely interfere

D. Normal work (includes work outside the home and daily chores at home)

0	1	2	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Does not interferes										completely Interfere

E. Relations with other people

0	1	2	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Does not interferes										Completely interfere

F. Enjoyment of life

0	1	2	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Does not Interfere										Completely interferes

- **Fatigue scale:** no-fatigue [0], mild fatigue [1-3], moderate fatigue [4-6], sever fatigue [7-10]

Annex IV: Information Sheet (Amharic Version)
አዲስ አበባ ዩኒቨርሲቲ

ነርስ ትምህርት ቤት እና አዋላጅ ትምህርት ቤት

ጥቁር አንበሳ ስፔሻላይዝድ ሆስፒታል ውስጥ በመታከም ላይ በሚገኙ የካንሠር ታማሚዎች ስለህመማቸው ሁኔታ መረጃ ለመሰብሰብ የተዘጋጀ መጠይቅ፣ 2019ዓ.ም

መለያ ቁጥር_____

ተሳታፊዎች በጥናቱ ለመሳተፍ ፈቃደኝነታቸዉን የሚገልፁበት ቅጽ

ጤና ይስጥልኝ እኔ _____ እባላለሁ በአሁኑ ወቅት በአዲስ አበባ ዩኒቨርሲቲ፣ ነረሰ ተማሪ ስሆን፣ ይህ ጥናት የማስተርስ ማሙያ ወረቀት ነው። በመሰራት ላይ ያለው ጥናት የካንሠር ህሙማንን የድካም ሁኔታ በተገቢው ሁኔታ ለመገምገም የሚያስችል መጠይቅ ማዘጋጀትነው። ከዚህ በመቀጠል ስለሚሰማዎት የድካም ሁናቴ በተመለከተ አጭር የድካም መለኪያ ዝርዝር በሚባል መጠይቅ የተወሰኑ ጥያቄዎችን ልጠይቅዎት እወዳለሁ። መጠይቁ ከጊዜዎ ቢበዛ 30 ደቂቃ የሚወስድ ሲሆን በዚህ ጥናት ውስጥ የርስዎ ተሳታፊነት ሙሉ በሙሉ በርስዎ ፈቃደኝነት ላይ የተመሰረተ ነዉ፤ በዚህ ጥናት ውስጥ መሳተፍዎም ሆነ ላለመሳተፍ መወሰንዎ በሆስፒታሉ ውስጥ በሚያገኙት አገልግሎት ላይ ምንም አይነት ተጽእኖ የማይኖረው ሲሆን ቃለመጠይቁን በማንኛውም ሰአት ማቋረጥ ወይም ጥያቄዎችን አለመመለስ ይችላሉ። በጥናቱ ውስጥ ለተነሱት ጥያቄዎች የሚሰጧቸው መልሶች ሙሉ በሙሉ በምስጢር የሚጠበቁ ሲሆን የርስዎም ስም በማንኛዉም መልኩ በጥናቱ ውስጥ አይገለጽም፤ እንዲሁም የሚሰጡት ምላሽ ከርስዎ ማንነት ጋር በማንኛውም መልኩ አይያያዝም።

በጥናቱ ለመሳተፍ ፈቃደኛ ነዎት?

አዎ አይደለሁም

ፈቃደኛ መሆናቸውን ካረጋገጡ ቃለመጠይቁን ይጀምሩ

ፈቃደኛ ካልሆኑ ወደሚቀጥለው ተገልጋይ ይሸጋገሩ

ቃለ-መጠይቁ የተደረገበት ቀን _____

የተጀመረበት ሰዓት_____

ያለቀበት ሰዓት_____

ክፍል አንድ- እርስዎን በተመለከተ አጠቃላይ መጠይቅ

101 ፆታ □ ወንድ □ ሴት

102 እድሜዎት----------

1.3 የጋብቻ ሁኔታ □ ያላገባ/ች □ባለትዳር □አግብተው የፈቱ □ የትዳር ጓደኛን በሞት ያጡ

1.4 በአሁኑ ወቅት ያለዎት የትምህርት ደረጃ □ ማንበብና መፃፍ አለችልም □ አንደኛ ደረጃ ትምህርት
□ ሁለተኛ ደረጃ ትምህርት □ ሁለተኛ ደረጃ በላይ

1.5 የስራ ቅጥር ሁኔታ □ የመንግስት ሰራተኛ □የግል መሥሪያ ቤት ተቀጣሪ □ነጋዴ □ ተማሪ
□ አርሶአደር □ ሥራ የሌለው/የሌላት □ጡረተኛ/ በጡረታ □ ሌሎች፣ ይገለፅ_____

1.6 ሃይማኖት

□ ኦርቶዶክስ □ ሙስሊም □ ፕሮቴስታንት □ካቶሊክ □ ሌሎች፣ ይገለጽ_____

1.7 የመኖሪያ አድራሻ □ ከተማ □ ከተማ ውጭ፣_____

1.8 የክፍያ ሁኔታ □ መስሪያ ቤቴ ይከፍላል □ በነፃ ታካሚ

1.9 የድካም ስሜት እየተሰማዎት እንደሆነ ለሀኪሞት ተናግረዋል? □ አዎ □ አይ

1.10 አይ ካሉ, ምክንያቶት ምንድ ነው?

መለያ # የህክምና ጣቢያ #

ቀን ፡ _____/ _____/ _____ ሰዓት ፡ _____ አብዛኞቻችን በህይወታችን ውስጥ ድካም ይሰማናል። እርሶ ባለፈው ሳምንት ውስጥ ያልተለመደ የድካም ስሜት ተሰምቶት ነበር ?አዎ □ አይ□

1 እባኮትን አሁን እየተሰማዎት ያለውን የድካም ስሜ ት ደረጃውን ቁጥሩን በማክበብ ይግለጹ

0 1 2 3 4 5 6 7 8 9 10

ምንም ድካም የለኝም በከፍተኛ ሁኔታ ይሰማኛል

2. እባኮትን ባለፉት 24 ሰዓታት ይሰማዎት የነበረው የተለመደ የድካም ስሜት ደረጃውን ቁጥሩን በማክበብ ይግለጹ

0 1 2 3 4 5 6 7 8 9 10

ምንም ድካም የለኝም በከፍተኛ ሁኔታ ይሰማኛል

3. እባክዎትን ባለፉት 24 ሰዓታት ይሰማዎት የነ በረው አስከፊ የሆነ የድካም ስሜት ደረጃውን ቁጥሩን በማክበብ ይግለጹ

0 1 2 3 4 5 6 7 8 9 10

ምንም ድካም የለኝም በከፍተኛ ሁኔታ ይሰማኛል

4. እባክዎትን ባለፉት 24 ሰዓታት ይሰማዎት የነ በረው የድካም ስሜት የነ በረው ማወክ(ተጽእኖ)

ሀ. በአጠቃላይ እንቅስቃሴዎት ላይ

0 1 2 3 4 5 6 7 8 9 10

ምንም አላወከኝም ሙሉ በሙሉ አውኮኛል

ለ. በስሜትዎ ላይ

0 1 2 3 4 5 6 7 8 9 10

ምንም አላወከኝም ሙሉ በሙሉ አውኮኛል

ሐ. በሚራመዱበት ጊዜ

0 1 2 3 4 5 6 7 8 9 10

ምንም አላወከኝም ሙሉ በሙሉ አውኮኛል

መ. በመደበኛ ስራዎት (በቤትና በውጪ በሚያደርጉት የዘወትር የስራ እንቅስቃሴ)

0 1 2 3 4 5 6 7 8 9 10

ምንም አላወከኝም ሙሉ በሙሉ አውኮኛል

ሠ. ከሰዎች ጋር ባሎት ግንኙነ ት

0 1 2 3 4 5 6 7 8 9 10

ምንም አላወከኝም ሙሉ በሙሉ አውከኛል

ረ. በኑሮዎት መደሰት ላይ

ምንም አላወከኝም ሙሉ በሙሉ አውከኛል