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ORIGINAL RESEARCH

Prevalence of Fatigue and Associated Factors Among Cancer Patients Attending Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia

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Background: Fatigue is a subjective and distressing symptom in cancer patients and has profound effects on daily life. The rates of fatigue during treatment are reported to be 25–90%. Its causes are secondary to their treatment course, cancer itself and associated factors.
Purpose: To assess the prevalence of fatigue and associated factors among cancer patients at Tikur Anbessa Specialized Hospital in Addis Ababa, Ethiopia, 2019.
Patients and Methods: A cross-sectional study design was conducted on cancer patients undergoing treatment in Tikur Anbessa Specialized Hospital. A sample of 278 was selected using systematic random sampling technique and Brief Fatigue Inventory questionnaire was used for data collection. The data were entered into EPI data version 3.1 and transferred to SPSS version 24 for analysis. Bivariate and multivariable logistic regression were conducted to summarize the data. The significant statistical test was determined at 95% confidence interval and at $p<0.05$.
Results: The mean age of the participants was 44.9 ± 14 years. The prevalence of fatigue identified by this study was 208 (74.8%). Age, stage of cancer, presence of infection, type of cancer, and type of treatment had shown a significant association with fatigue [AOR = 3.15, 95% CI: (1.35–7.34)], [AOR = 0.02, 95% CI: (0.003–0.172)], [AOR = 4.15, 95% CI: (1.06–16.07)], [AOR = 5.19, 95% CI: (1.59–16.90)], [AOR = 0.18, 95% CI: (0.07–0.462)] respectively.
Conclusion: The prevalence of fatigue in cancer patients in this study was high. Risk factors were age of the patients, stage of cancer, presence of infection, cervical cancer and radiation therapy.
Keywords: cancer, fatigue, chemotherapy, specialized hospital, Ethiopia

Introduction

Cancer now ranks as the leading cause of death globally and it has a great impact on affected people.[1] The number of worldwide 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 on 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 the European Association for Palliative Care (EAPC) fatigue is defined as "a subjective feeling of tiredness, weakness or lack of energy".[4] The National Comprehensive Cancer Network (NCCN) defines fatigue 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]

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Fatigue in cancer patients is seven times more prevalent than fatigue in the normal population and it is different from normal fatigue due to overexertion or lack of sleep.[9] In addition to the direct impact of cancer, various treatment modalities, particularly chemotherapy and radiation, are known to cause fatigue for many patients for an extended period of time.[10]

Globally, an estimated 50–90% of cancer patients experience the difficulties of fatigue, the latter number being for patients subjected to chemotherapy and radiotherapy.[11] Fatigue is now understood to be the most common symptom associated with cancer and its treatment and is an underestimated symptom in cancer patients.[10,12–14] The causes are multifactorial such as cancer itself, cancer treatment, malnutrition, opioids, anxiety medication effect, etc.[15,16]

With the continued development of cancer diagnostic and therapeutic technologies, patient survival duration has been significantly extended. However, fatigue related to treatment for 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 and it can be treatable if provided proper care.[10,17–19] Fatigue occurs most often after surgery, chemotherapy, radiotherapy and cancer patients report it as the major obstacle to normal functioning and a good quality of life.[12,14,20] Differences in the incidence and severity of fatigue have been noted by age, gender, stage of disease, and functional ability and these variances 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]

Fatigue in cancer patients has been reported in 90% of patients treated with radiation, and 80% of those under chemotherapy treatment.[10,22] It affects the physical, social, cognitive, and emotional life of the patients and their families; however, it remains an under-recognized and undertreated problem in cancer survivors.[6,23] Fatigue management strategies tend to focus on both non-pharmacological and pharmacological in which non-pharmacological treatment accounts for 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.[24–27] Unlike other symptom treatments fatigue requires a general supportive care developed by the NCCN and the oncology of nursing society.[25] Nevertheless, knowledge about this condition remains fragmentary and scarce.[28]

Health care professionals focus on symptoms, such as pain, nausea, and vomiting. These may be the reason why the patients stop their treatment schedule and refuse to go for next follow-up due to fatigue.[10,29] Cancer is still a challenge for low- and middle-income countries. This is due to limited information in Ethiopia related to the prevalence of fatigue in cancer-diagnosed patients and its associated factors at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2019.

Patients and Methods

Study Area and Period

The study was conducted at the oncology clinic Tikur Anbessa Specialized Hospital, College of Health Sciences, Addis Ababa University, Ethiopia. The study was conducted from February 1 to March 30, 2019 at the oncology unit of TASH, College of Health Sciences, Addis Ababa University, Ethiopia.

Study Design and Population

An institutional based cross-sectional study was conducted among all adult cancer patients attending the oncology unit.

Inclusion and Exclusion Criteria

Patients diagnosed with cancer and undergoing treatment and aged >18 years were included and patients who suffer from mental or cognitive disorders and not willing to participate were excluded.

Sample Size Determination

The sample size was calculated using single population proportion formula, assuming p = 0.5 n = 384.

Since flow of patients during data collection period is less than 10,000 then correction formulas will be applied. NF = n/1 + n/N = 384/1 + 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.

Sampling Technique

Tikur Anbessa Specialized Hospital (TASH) is the only public hospital treating cancer patients in the country. The oncology unit of TASH patients who fulfilled the criteria

was identified from their charts. A one-year record check of adults receiving chemotherapy cancer treatment traced 9,000 cases in the oncology unit. 750 patients had monthly follow-up treatments and then 278 patients were sampled within the study period by simple random sampling and/or systematic sampling technique for every two patients (chemotherapy cancer treatment) and were enrolled in the study.

Data Collection Tools and Procedures

A standard Brief Fatigue Inventory (BFI) questionnaire was used to collect the required data in the form of an exit interview. The data collection tool has two parts, the first contained patient socio-demographic information and the second part contained a BFI scale questionnaire. The original English version of the BFI was first translated into Amharic by two independent translators and then back translated into English by another independent translator who had not seen the original English version. All the translators are language experts who are fluent in English. Next, the English back-translated versions were compared with the originals. In case a back-translated item did not agree with the original, the first two translators performed a second translation and the second two translators performed second back-translations. It is a brief questionnaire, which consists of ten items, using a numerical rating scale of 0–10 and was checked for validity and reliability. Three nurses with a Bachelor of Science degree in nursing and one with previous experience of supervision were recruited to administer the interviews.

Data Quality Control

Training was given to interviewers about techniques and the concept of the questionnaire before data collection. Moreover, the instrument was pretested on 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 checking the completeness and consistency of the data.

Data Processing and Analysis

The collected data were cleaned, checked, coded and entered into Epi data, version 3.1, software and exported to SPSS, version 24, for analysis. Frequency distribution and percentage of different variables were computed to describe and summarize the basic social demographic characteristics of the respondents. Binary logistic regression was run to determine the COR and variables with $p < 0.25$ was run on a multivariate logistic regression model. The statistical significance of the variable was declared at $p < 0.05$ and odds ratio at 95% confidence interval.

Results

Socio-Demographic Characteristics

A total of 278 patients diagnosed with cancer, composed of 124 males and 154 females, participated in this observational study. The mean age of the participant was 44.9 ± SD 14 years. Table 1 shows that, of the total study participants, 55% live in an urban area and 45% in a rural area.

Clinical Characteristics

The study participants were diagnosed with all types of cancer and were undergoing treatment. All of the participants received treatment in the form of chemotherapy, radiation and surgery as indicated in Table 2 and about 23.0% had infections.

Prevalence of Fatigue and Treatment Modality

Figure 1 shows the relationship between prevalence of fatigue and treatment modality among cancer diagnosed patients in TASH, Addis Ababa, Ethiopia.

Interference with Daily Routine Activities

Fatigue interferes with the normal activities of cancer-diagnosed patients in TASH, as presented in Figure 2.

Associated Factors with Fatigue in Cancer Diagnosed Patients

During bivariate logistic regression analysis; variables with significance level <0.25 were considered in multivariable logistic regression. Those independent variables with a p value of less than 0.25 in bivariate analysis (age, level of education, address, type of cancer, stage of cancer, type of treatment and presence of infection) were entered into multivariable logistic regression analysis. By controlling confounding factors the following five variables (age, stage of cancer, presence of infection, type of cancer and type of treatment) had shown a significant association, with $p<0.05$.

Accordingly, patients whose age was from 41–60 years were 3 times more likely to have fatigue than those from age 20–40 years [AOR = 3.2, 95% CI (1.35–7.34), p = 0.008]. The odds of developing fatigue among patients who had stage I cancer was 98.0%, stage II cancer 89.0% and stage III cancer was 84.0% less likely to have fatigue than patients

Table 1 Socio-Demographic Characteristics of the Cancer Patients in TASH, Addis Ababa, Ethiopia, 2019 (n = 278)

Variables	Frequency	Percentage
Age		
20–40	102	37
41–60	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 status		
No education	108	39
Primary	36	13
Secondary	68	25
Above Secondary	66	24
Occupational status		
Government	51	18
Private	51	18
House wife	77	28
Student	29	10
Merchant	21	8
Farmer	45	16
Retired	3	1
Others	1	0.4
Monthly income		
<500ETB	94	34
500–1000 ETB	84	30
1100–2000 ETB	67	24
>2000 ETB	33	12
Medical payment		
Paid	11	4
Free	267	96
Type of admission		
New	11	4
Repeated	267	96

Abbreviation: ETB, Ethiopian birr.

Table 2 Clinical Characteristics of Cancer Diagnosed Patients in TASH, Addis Ababa, Ethiopia, 2019 (n = 278)

Variables	Frequency	Percentages
Stage of cancer	11	4
Stage 1		
Stage 2	58	21
Stage 3	114	41
Stage 4	95	34
Type of cancer		
Colorectal ca	37	13
Breast ca	68	24
Cervical ca	82	29
Rectal ca	20	7
Esophageal ca	16	5.8
Colon ca	25	9
Sarcoma	18	7
Others	12	4
Type of treatment		
Radiation therapy	154	55.4
Chemotherapy	80	29
Surgery	32	11
Chemo and radiation	5	1.7
Chemo and surgery	7	2.5

with stage IV cancer [AOR = 0.02, 95% CI (0.003–0.172), p = 0.001], [AOR = 0.109, 95% CI (0.030–0.397), p = 0.001], [AOR = 0.2, 95% CI (0.048–0.535), p = 0.003], respectively. Furthermore, the odds of fatigue were 4 times more likely in cancer patients who had the presence of an infection than cancer `patients with no infection [AOR = 4.2, 95% CI (1.-064–16.069), p = 0.002]. On the other hand, the odds of fatigue were 5 times greater in breast cancer patients, about 8 times greater in cervical cancer patients and 8 times greater in colon cancer patients than for patients with colorectal cancer [AOR = 5.2, 95% CI (1.590–16.9), p = 0.006], [AOR = 8.3, 95% CI (2.234–30.610)], [AOR = 7.6, 95% CI (1.317–44.262) p = 0.023] respectively.

Finally, those who got treatment chemotherapy (82.0%), surgery (87.4%) and chemo and radiation (97.8%) were less likely than patients who who underwent radiation therapy to suffer from fatigue [AOR = 0.2, 95% CI (0.068–0.462), p = 0.001], [AOR = 0.13, 95% CI (0.-041–0.388), p = 0.001], [AOR = 0.021, 95% CI (0.002–-0.287), p = 0.004], respectively, as indicated in Table 3.

Discussion

This study identified the prevalence of fatigue and associated factors among cancer patients on 278 study participants and fatigue is the most widespread observable fact in individuals with cancer who receive radiation therapy, chemotherapy and the most long-lasting impact felt during and after treatment. The prevalence of fatigue was 74.8%

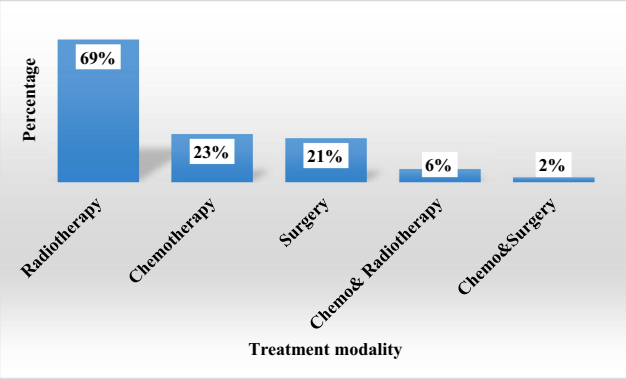

Figure 1 Bar chart showing relationships between prevalence of fatigue and treatment modality among cancer diagnosed patients in TASH, Addis Ababa, Ethiopia, 2019 (n = 278).

in this study and this finding is consistent with the studies conducted in the Netherlands and Alabama.[21,25] However, this result is higher than the results reported in Norway, Italy, Germany and Canada[22,28] and lower than the study results found in Texas, Poland, Jordan, and India.[30–34] This discrepancy could be due to the difference in socioeconomic status and health care delivery system. This study showed that fatigue in patients who had received radiation therapy is similar to the prevalence of fatigue among patients receiving radiotherapy reported in the UK but lower than the result found in Rasht teaching hospital.[31]

This study showed that patients whose age was 41–60 years were 3 times more likely to have fatigue than those from age 20–40 years [AOR = 3.2, 95% CI (1.352–7.336), p = 0.008]. This is consistent with the studies conducted in the Netherlands and North Carolina.[30]

Patients who had stage III cancer were significantly associated with the prevalence of fatigue [AOR=0.2, 95% CI (0.048–0.535), p=0.003] and this finding is in line with the study results from China, Sweden, and a USA hospital.[10,12] This study indicated that a higher stage of cancer shows high scores of fatigue, which is comparable with meta-analysis conducted in women breast cancer survivors with stage III cancer and treated with chemotherapy who were at a higher risk for severe fatigue than survivors with stage I cancer.[31] The present study showed the prevalence of fatigue among types of cancer such as cervical and breast cancer is consistent with the study result reported in India that the most prevalent fatigue was cervical cancer (28.6%), followed by breast cancer.[32] Clinical factors like infection have been seen as causative elements in fatigue and that was identified in this

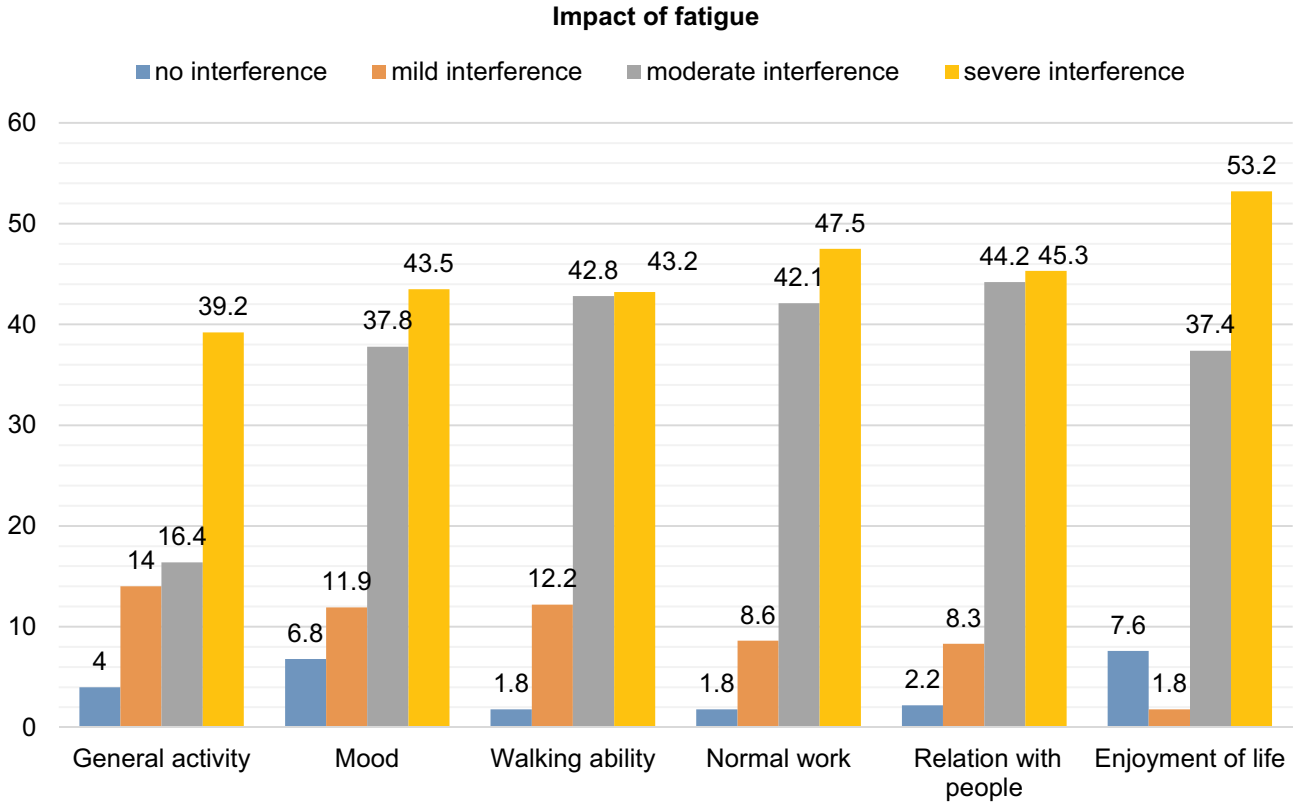

Figure 2 Fatigue interference with normal activities of cancer-diagnosed patients in TASH, Addis Ababa, Ethiopia, 2019 (n = 278).

Table 3 Multivariable Logistic Regression Analysis Among Cancer Patients Undergoing Treatment in TASH, Addis Ababa, Ethiopia, 2019 (n = 278)

Variables	Fatigue		COR (95% CI)	AOR (95% CI)
	Present Fatigue	Absent Fatigue		
Age				
20–40	65(31%)	37(53%)	1	1
41–60	116(56)	21(30%)	3.144	3.2(1.352–7.338)**
>60	27(13%)	12(17%)	1.281	1.8(0.577–5.558)
Level of education				
No education	85(41%)	23(33%)	1.977	0.9(0.160–5.962)
Primary	26(13%)	10(14%)	1.391	1.8(0.453–6.870)
Secondary	54(26%)	14(20%)	2.063	2.3(0.783–6.691)
More than secondary	43(21%)	23(33%)	1	1
Residence				
Urban	107(51%)	46(66%)	0.553	0.6(0.119–2.747)
Rural	101(48.6%)	24(34%)	1	1
Stage of caner				
Stage 1	2(1%)	9(13%)	0.015	0.02(0.003–0.172)**
Stage 2	38(18%)	20(29%)	0.128	0.1(0.030–0.397)**
Stage 3	79(38%)	35(50%)	0.152	0.2(0.048–0.535)**
Stage 4	89(42.8%)	6(8.6%)	1	1
Presence of infection				
Yes	47(23%)	3(4.3%)	6.52	4.2(1.064–16.069)**
No	16(77.45%)	67(95.7%)	1	1
Type of cancer				
CRC	18(9%)	19(27%)	1	1
Breast ca	53(25%)	15(21%)	3.730	5.2(1.590–16.935)**
Cervical ca	70(34%)	12(17%)	6.157	8.3(2.234–30.610)**
Rectal ca	15(7%)	5(7%)	3.167	3.1(0.602–15.886)
Esophageal ca	11(5%)	5(7%)	2.322	2.3(0.417–12.287)
Colon ca	22(11%)	3(4%)	7.741	7.6(1.317–44.262)**
sarcoma	11(5%)	7(1%)	1.659	1.6(0.315–8.317)
others	8(3.8%)	4(5.7%)	2.111	3.1(0.510–18.552)
Type of treatment				
Radiation therapy	137(68.9%)	17(24.0%)	1	1
Chemotherapy	49(23%)	31(44%)	0.196	0.2(0.068–0.462)**
Surgery	15(21%)	17(6%)	0.109	0.1(0.041–0.388)**
Chemo and radiation	1(0.5)	4(5.7)	0.031	0.2(0.002–0.287)**
Chemo and surgery	6(2.9%)	1(1.4%)	0.745	1.5(0.122–17.323)

Note: **p-value <0.05.
Abbreviations: COR, crude odds ratio; AOR, adjusted odds ratio; CRC, colorectal cancer.

study and it is consistent with the study results reported from the Netherlands of increased risk for severe fatigue following cancer treatment.[33]

The present study shows that treating with chemotherapy, surgery and chemoradiation has the highest prevalence of fatigue, which is in line with the study results from India, Texas and the USA that after a course of chemotherapy treatment patients rated their level of fatigue as moderate to severe.[34–36]

Conclusion

The prevalence of fatigue in this study is high. Age, stage of cancer, presence of infection, type of cancer and type of treatment had shown a significant association with fatigue.

However, in this study sex of the patients, address, marital status, level of education, occupation, monthly income, medical payment, and type of admission had no significant association with fatigue. Yet, it is difficult to conclude that those variables are not completely important.

Fatigue profoundly affects patients' abilities to perform activities associated with daily living and limits their personal and social roles within their family and community, resulting in a significant decrement in overall quality of life.

Ethics Approval and Consent to Participate

Ethical approval of the study was obtained from the Institutional Review Board (IRB) of the College of Health Sciences, Addis Ababa University with Protocol number: 010/19/SNM. Prior to administering the interview, the objectives of the study were clearly explained to the participants and written consent was obtained. Participants were informed that their participation was voluntary and that they could withdraw from the study at any time if they wished to do so and this would not affect any service that they will get from the institution. All the information given by the respondents has been used for research purpose only. Participants' privacy and confidentiality of the information were maintained by the Declaration of Helsinki.

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Disclosure

The authors declare that they have no conflicts of interest for this work.

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