

## Research Article

# Chemotherapy and Cancer Related Fatigue: A Prospective Study in Rural Cancer Survivors of Malwa Region of Punjab

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## Abstract

**Objective:** The objective of this non-interventional, 7 months observational study was to analyze the prevalence of the Cancer Related Fatigue (CRF) in cancer patient populations who were receiving chemotherapy and those who were not receiving chemotherapy.

**Materials and methods:** This was an observational study. Based on the inclusion and exclusion criteria, 60 subjects (24 male and 36 females) diagnosed with cancer enrolled for the study, which was further allotted into group A (n=30) which was receiving chemotherapy and group B (n=30) which was not receiving chemotherapy. The data collection was performed by administering the validated Fatigue Symptoms Inventory (FSI) scale after obtaining the informed consent.

**Results:** The mean age of Group A and B is 49 years and Group B 51 years respectively. The mean FSI score of the group receiving chemotherapy was  $35.70 \pm 17.14$  whereas the mean FSI score of group not receiving chemotherapy was  $19.50 \pm 16.05$ . Independent t test was applied and independent t value came out to be 2.18. An equal variance t test revealed statistically indicating a significant difference in FSI scores in groups receiving chemotherapy and not receiving chemotherapy ( $p=0.042$ ).

**Conclusion:** From the results we concluded that Cancer-related fatigue is highly prevalent in the patients who are receiving chemotherapy than those who are not receiving chemotherapy. The underlying causes of CRF are poorly understood and further research is warranted in order to assess CRF before and after treatment and develop effective, patient centered management strategies and to improve quality of life.

**Keywords:** Fatigue symptoms inventory; Cancer related fatigue; Chemotherapy; Prevalence

## Introduction

With a population of over 1 billion people India is the second most popular country in the world. Being a developing country India is dealing with the burden of non-communicable diseases [1]. Globally, non-communicable diseases are emerging as a major public health problem. It is not only affecting the developing countries but developed countries also [2].

Cancer is a non-communicable disease and the second most common cause of death in India after cardiovascular disease. Day by day cancer cases are increasing rapidly among Indian population because of low awareness and late detection. According to National Cancer Institute "Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. Cancer cells can spread from one part to other parts of the body through the blood and lymph systems". It affects individuals from different sexes, ages and races [3]. As per the Indian Council of Medical Research (ICMR), India had 14 lakh cancer patients in 2016 and this number is

expected to increase. There are more than 100 types of cancers; almost any part of the body can be affected. The five most frequent cancers in India between men and women are breast, cervical, oral cavity, lung and colorectal. These top five account for 47.2 per cent of all cancers; these cancers can be prevented, screened for and/or detected early and treated at an early stage. This could significantly reduce the death rate from these cancers [4,5].

Chemotherapy is one of the principal modes of the treatment of cancer patients [6]. Chemotherapy uses drugs to kill cancer cells (cytotoxic drug) or limit the growth of cancer cells (cytostatic drugs). Generally, chemotherapy is combined with either radiotherapy or surgery. Chemotherapy can be done before surgery to shrink the tumours making it easy to remove or after surgery to kill the remaining cancer cells [7]. Constant fatigue is documented as one of the most frequent, ongoing symptom description by the patients following cancer treatment. Cancer Related Fatigue (CRF) is a distressing, continual and the personal sense of physical, emotional, and/or cognitive fatigue or tiredness. Fatigue linked with cancer or its treatment is dissimilar from the characteristic fatigue that most people experience as a result of usual daily life. Distinct to classic fatigue in normal persons, CRF is inconsistent with physical exertion level and is not relieved by rest or sleep [8]. A number of studies have documented that fatigue occurs in 30% to 70% of all patients at some point during the cancer journey and that it may continue after cancer treatment has been completed. CRF affects one's perceived overall quality of life by impacting physical, functional, and cognitive domains. The etiology of CRF is multifactorial, with varying degrees of contribution from biological cancer factors, cancer treatment, immune system

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deregulations, secondary anaemia, opioid medications, anorexia, poor sleep quality and cognitive dysfunction [9].

Therefore the present study is aimed to determine the prevalence of cancer related fatigue among cancer patients receiving chemotherapy and patients who are not receiving chemotherapy.

## Materials and Methods

This Descriptive cross sectional study was conducted in the Guru Gobind Singh Medical College and Hospital, Baba Farid University of Health Sciences Faridkot. The sample size was calculated by G-Power software. The calculated sample size was 60. Both male and female diagnosed with cancer between the age group 30-60 years were included in the study. Subjects with co-morbid conditions, systemic cardiovascular or neurological disorders, cancer of brain, receiving radiotherapy, history of fractures, disability, complication of cancer related surgery and history of psychiatric illness or being treated with psychotropic drugs were excluded from the study.

A total of 60 cancer patients were divided into two groups (A and B). The group A (n=30) were receiving chemotherapy in the Day Care Ward of Guru Gobind Singh Medical College and Hospital were assessed as per exclusion and inclusion criteria, and group B (n=30) was not received chemotherapy. All the patients were assessed for demographic profile and detailed medical/surgical history was taken through individual interviews as well as medical records. The whole procedure was explained to the included subjects and the informed consent was taken from them prior to the study. All the subjects were assessed for the cancer related fatigue using Fatigue Symptom Inventory (FSI) scale. FSI is a brief self-report measure; the scale was required between 5 min and 10 min for completion. The FSI is a reliable and valid instrument to assess fatigue level in cancer patients [10].

## Description of the Scale

FSI is a 14-item self-report measure designed to assess the severity, frequency, and daily pattern of fatigue as well as its perceived interference with quality of life. Severity is measured on separate 11-point scales (0=not at all fatigued; 10=as fatigued as I could be) that assess most, least, and average fatigue in the past week as well as current fatigue. Frequency is measured as the number of days in the past week (0-7) that respondents felt fatigued as we average they felt fatigued (0=none of the day; 10=the entire day). Perceived interference is measured on separate 11-point scales (0=no interference; 10=extreme interference) that assess the degree to which fatigue in the past week was judged to interfere with general level of activity, ability to bathe and dress, normal work activity, ability to concentrate, relations with others, enjoyment of life, and mood. These interference ratings can be summed to obtain a total perceived interference score. The final item provides qualitative information about possible diurnal variation in the daily experience of fatigue.

**Scoring:** Items use an 11-point, Likert-type scale that ranges from one fatigue-related extreme to another (lower points on the scale denote less acute problems with fatigue). A global score can be obtained for items 1-13. Question 14 is meant to provide qualitative data only.

## Results

The data was analysed using the SPSS 20 for window version (SPSS Inc, Chicago, 2, USA) For windows 7 Professional, Descriptive statistics were reported as means and Standard Deviation (SD) for continuous data or as percentage of counts. The level of significance

was set at  $p < 0.05$ . Independent t-test was used to compare the values in both the Groups.

Figure 1 showing the graphical representation of different types of cancer among total sample. Out of 60, the highest frequency (24) was of breast cancer patients whereas the patients suffering from endometrium cancer are on second higher level which is (10). The third higher level was of adrenal cancer which is (7). The oral and oesophagus cancer level patients were same in number which was (5) for both. The blood cancer, Hodgkin Lymphoma and lung cancer patients had number of 4, 2 and 3 respectively as showing in graph.

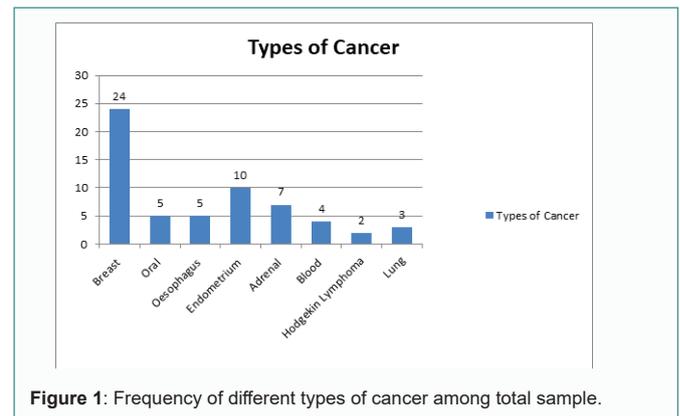


Figure 1: Frequency of different types of cancer among total sample.

Table 1 showing the demographic characteristics of the sample. The total number of sample is 30 (n=30) in Group A in which 14 patients were male and 16 were female. The mean age of sample of Group A was 49. The other group was B in which the total number of sample is again 30 (n=30) in which 10 patients were male and the other 20 were female and the mean age of this group is 51.

Table 1: Demographic Characteristics of the Sample (n=60).

	Total sample (n=60)	
	Group A(n=30)	Group B(n=30)
Male	14	10
Female	16	20
Mean age	49	51

Table 2 shows the distribution of total sample size (n=60) on Fatiguesymptom Inventory Scale (FSI) amongst the cancer patients based on the scores given by them during the study period. 11 out of 60 patients felt most fatigued with a score of 8/10. It was also found that 18.3% reported least fatigued with a score of 7 out of 10. However, a maximum of 20% patients ranked their level of fatigue to an average level. 15/20 patients reported to be fatigued at the time of questionnaire. Further, 6.7% to 23.3% patients reported the interference of fatigue with their daily routine with scores ranging from 3-9 out of 10. All the patients answered fatigue as an interference with the ability to bath and dress (score 3-9). Fatigue was also found to influence the normal work activity, ability to concentrate, and relationship with others as well as enjoyment of life and mood (Table 2).

Table 3 describes comparison of mean scores of fatigue symptom inventory in patients receiving chemotherapy and not receiving chemotherapy. The mean FSI score of the group receiving chemotherapy was  $35.70 \pm 17.14$  whereas the mean FSI score of group not receiving chemotherapy was  $19.50 \pm 16.05$ . Independent t test was applied and independent t value came out to be 2.18. An equal variance t test reveal statistically indicating a significant difference in FSI scores in groups receiving chemotherapy and not receiving chemotherapy ( $p=0.042$ ).

**Table 2:** Distribution of total sample on FSI among cancer patients at different level.

Variables (FSI Components)	Score												Total
	0	1	2	3	4	5	6	7	8	9	10		
Most Fatigued	N	0	6	6	7	4	2	6	10	11	8	0	60
	%	0	10	10	11.7	6.7	3.3	10	16.7	18.3	13.3	0	100%
Least Fatigued	N	0	3	5	7	7	5	7	11	7	7	1	60
	%	0	5.0	8.3	11.7	11.7	8.3	11.7	18.3	11.7	11.7	1.6	100%
Average Fatigued	N	0	4	6	6	5	7	3	12	8	9	0	60
	%	0	6.7	10	10	8.3	11.7	5.0	20	13.3	15	0	100%
Current level of Fatigue	N	0	0	5	7	4	6	9	6	8	15	0	60
	%	0	0	8.3	11.7	6.7	10	15.0	10.0	13.3	25.0	0	100%
General level of activity	N	0	0	0	8	6	6	4	14	12	10	0	60
	%	0	0	0	13.3	10.0	10.0	6.7	23.3	20.0	16.7	0	100%
Ability to bath and dress	N	0	0	0	2	10	7	12	14	13	2	0	60
	%	0	0	0	3.3	16.7	11.7	20.0	23.3	21.7	3.3	0	100%
Normal work activity	N	0	0	0	7	9	8	3	5	13	12	3	60
	%	0	0	0	11.7	15.0	13.3	5.0	8.3	21.7	20.0	5.0	100%
Ability to concentrate	N	0	0	0	4	12	6	8	14	13	3	0	60
	%	0	0	0	6.7	20.0	10.0	13.3	23.3	21.7	5.0	0	100%
Relations with other	N	0	4	8	10	5	7	15	9	2	0	0	60
	%	0	6.7	13.3	16.7	8.3	11.7	25.0	15.0	3.3	0	0	100%
Enjoyment of life	N	0	0	2	6	10	4	9	22	6	1	0	60
	%	0	0	3.3	10.0	16.7	6.7	15.0	36.7	10.0	1.6	0	100%
Mood	N	0	0	0	2	10	9	11	16	12	0	0	60
	%	0	0	0	3.3	16.7	15.0	18.3	26.7	20.0	0	0	100%

**Table 3:** Comparison of mean value for fatigue symptom inventory among cancer patients.

	FSI			t value	p value
	Mean	SD	SEM		
Group A	35.70	17.14	5.42	2.18	0.042(S)
Group B	19.50	16.05	5.08		

\*p&lt;0.05=Significant

## Discussion

Fatigue is a most common symptom experienced by cancer patients. It has been reported to occur in a majority of patients. The pathophysiology of CRF has not been adequately clear. Researcher have focused on understanding factors that contribute to CRF, including the disease itself, treatments received, and a variety of chronic physical or psychological co morbid conditions [11]. Some researches stated that fatigue during chemotherapy is common and may be associated with anaemia or with accumulation of end products from cell destruction [12,13]. Chemotherapy drugs that cross the blood-brain barrier may induce neurotoxicities that produce fatigue [14].

Therefore the present study intended to find the prevalence of fatigue in cancer patients who was receiving chemotherapy and who were not receiving chemotherapy. And finding of the study indicate a statistically significant difference in the mean FSI scores in the group receiving chemotherapy and the group not yet receiving chemotherapy among the cancer patients.

Banipal et al. [8] had done a study on 126 cancer patients and find that 80% of the participants experienced fatigue during their course of treatment and Females has more fatigue scores than males. Patients who received vinblastine, dacarbazine, and cyclophosphamide based chemotherapy had statistically higher scores of fatigue. A study by Donovan et al. [15] provides the first evidence that among women with early stage breast cancer, chemotherapy is related to more severe fatigue than radiotherapy, which is similar to our results. No doubt cancer is the major detrimental problem which has far reaching effects on patient's physical, mental, emotional and social aspects, side effects of cancer related fatigue are worldwide known. Among all

these side effects, CRF directly affects functional status of the patient. Hence, present study has clearly indicated that patients receiving chemotherapy are at greater verge of affection of CRF in comparison to those who are not receiving chemotherapy.

## Conclusion

From the results it is concluded that Cancer-related fatigue is a highly prevalent in the patients who is receiving chemotherapy than who are not receiving chemotherapy. The underlying causes of CRF are poorly understood and further research is warranted in order to develop effective, patient-centered management strategies and to improve quality of life and other outcomes. Effective interventions to reduce CRF both during and following treatment are urgently needed.

## Limitations of the Study

This study had certain limitations in terms of sample size as it was relatively small, Patients were not affected by a single type of cancer, The stage of cancer was not considered and Patient's socioeconomic status was not take into consideration. The study was limited to small geographical area of Punjab was another limitation of the study.

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