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Analysis of *Cancer Related Fatigue* (CRF) in Cancer Patients Undergoing Chemotherapy: A Cross-Sectional Study

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Abstract:
Background*: Cancer occurs due to abnormal genetic mutations that cause uncontrolled cell growth, forming malignant tumors that invade surrounding tissues and can spread to other organs. Cancer-related Fatigue (CRF) is an excessive and persistent fatigue commonly experienced by cancer patients, with a prevalence of 60% to 90% during active therapy and approximately 30% of patients experiencing chronic fatigue after treatment.*
Materials and Methods*: This study employed a quantitative descriptive design with a cross-sectional approach. The population in this study consisted of cancer patients undergoing chemotherapy. The sample was selected using a consecutive sampling technique based on predetermined inclusion criteria, resulting in a total of 64 respondents. Respondents' fatigue levels were measured using the Cancer Fatigue Scale (CFS). Data were analyzed descriptively using frequency distribution, percentages, mean, median, and standard deviation to describe respondent characteristics and the research variables.*
Result*: The results showed that all respondents experienced severe fatigue, with scores ranging from 41 to 50. The most frequently reported score was 50, found in 16 respondents (25%), followed by scores of 47 and 48, each reported by 11 respondents (17.2%).*
Conclusion: *The majority of cancer patients undergoing chemotherapy experienced severe fatigue. Assessing fatigue levels using the Cancer Fatigue Scale (CFS) is important to detect the degree of fatigue experienced by patients and to determine appropriate management for cancer patients*.
Key Word*: Cancer; Cancer Related Fatigue (CFS); Cancer Fatigue Scale (CFS)*

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I. Introduction

Cancer is a leading cause of death, accounting for 9.7 million deaths in 2022. Globally, the number of new cancer cases was estimated to be approximately 20 million. Lung, breast, colorectal, and prostate cancers are among the most commonly occurring cancers [(1)]. In Indonesia, in addition to stroke and heart disease, cancer is the third leading cause of death. In 2022, the incidence rates per 100,000 population were 41.8 for breast cancer, 27.7 for lung cancer, 24.6 for colorectal cancer, and 23.3 for uterine cancer. Historical data indicate that the number of cancer cases increased by nearly 40% from 2008 to 2022 [(2)]. Cancer treatment methods have continued to develop, ranging from chemotherapy, radiotherapy, and surgery to innovative therapies such as immunotherapy and targeted therapy. However, treatment-related side effects, such as nausea, fatigue, and immune system impairment, remain major challenges in the care of cancer patients. [(3,4)].

Cancer-related Fatigue (CRF) is one of the most common symptoms experienced by cancer patients from the time of diagnosis through the recovery process. CRF differs from other types of fatigue in terms of its severity and the inability to relieve it solely through rest or sleep. CRF can affect patients' physical, emotional, and cognitive functioning. The prevalence of CRF has been reported to range from 58% to 90%, depending on the type of cancer and the measurement method used [(5)]. In addition, CRF can also affect patients' psychological condition by increasing anxiety, depression, and emotional stress among cancer patients [(6)].

CRF is a frequently reported symptom among patients with breast cancer, with a prevalence of 66% [(7)]. Approximately 40% to 75% of patients with lung cancer experience CRF after treatments such as chemotherapy and radiotherapy [(8)]. The prevalence of CRF among patients with colorectal cancer has been reported to be 33% [(9)]. Among

patients with cervical cancer, 45.2% experience physical fatigue and 37.8% experience mental fatigue [10]. Meanwhile, 40% of patients with prostate cancer experience CRF as a result of radiotherapy [11].

Based on the review above, CRF is a common complication among cancer patients and has a significant impact on patients' quality of life. Assessment of fatigue levels in cancer patients is necessary to identify patients' physical, cognitive, and psychological conditions, thereby providing a clearer description of the severity and characteristics of fatigue experienced by patients.

II. Material And Methods

Study Design: Quantitative descriptive design with a cross-sectional approach

Study Location: This study wa conducted in the oncology inpatient ward of dr. Zainoel Abidin Regional General Hospital, Banda Aceh, Indonesia

Study Duration: The study was conducted from November 11, 2025 to January 31, 2026.

Sample size: The sample consisted of 64 respondents.

Sample size calculation: The sample size in this study was determined based on Cohen's tables, using a two-tailed test with an alpha value of 0.05. With a Cohen's d of 1.0, a power of 0.80, and an effect size of 0.50 (medium effect size), the required sample was calculated to be 64 respondents.

Subjects & selection method: Respondents were selected using consecutive sampling based on predefined inclusion and exclusion criteria. Data collection was conducted using the Cancer Fatigue Scale (CFS) instrument to assess the fatigue level of the respondents.

Inclusion criteria:

1. Cancer patients aged 18 years or older (adults).
2. Cancer patients who agreed to participate in the study.
3. Cancer patients residing in Banda Aceh and Aceh Besar during the course of treatment.
4. Cancer patients with a CRF score of 21–50 as measured by the Cancer Fatigue Scale (CFS).

Exclusion criteria:

1. Cancer patients with severe psychological disorders.
2. Cancer patients with metastatic disease.
3. Cancer patients with a prognosis of less than six months.

Procedure methodology

The study began with obtaining institutional approval and ethical clearance from the Ethics Committee of Dr. Zainoel Abidin Regional General Hospital, Banda Aceh (Approval Number: 327/ETIK-RSUDZA/2025). The researcher then coordinated with the head of the oncology inpatient ward to explain the study objectives. Respondents were subsequently selected according to the predefined inclusion criteria using consecutive sampling, resulting in a total of 64 participants. Demographic data, including age, sex, chemotherapy cycle, comorbidities, cancer type, and cancer duration, were collected from all respondents. Fatigue levels were assessed using the Cancer Fatigue Scale (CFS), an instrument previously validated for content and reliability by Fazylawati, demonstrating high reliability with a Cronbach's alpha coefficient of 0.88 for 15 items [12].

Statistical analysis

All collected data were verified to ensure completeness, consistency, and accuracy prior to data processing and analysis. Data analysis was performed using descriptive statistics, including frequency distributions, percentages, minimum–maximum values, means, and standard deviations, to describe the respondents' demographic characteristics and fatigue levels in cancer patients.

III. Result

Respondent Characteristics

Respondent characteristics included age, sex, chemotherapy cycle, comorbidities, cancer type, and cancer duration. The results of the analysis of respondent characteristics are presented in the following table.

Table no 1: Frequency Distribution of Respondents Demographic Characteristics (n = 64)

Karaktersitik Responden	f	%
Age		
Mean ± SD	46,19 ± 8,876	
Min-Max	28-63	

Sex		
Male	24	37,5
Female	40	62,5
Chemotheraphy Cycle		
Early (1-3 cycles)	24	37,5
Middle (4-6 cycles)	37	57,8
Advanced (>7 cycles)	3	4,7
Comorbidities		
No	58	90,6
Yes	6	9,4
Cancer Duration		
0 – 6 months	21	32,8
7 – 12 months	33	51,6
> 12 months	10	15,6

Based on Table 1, the total number of respondents in this study was 64 participants. The mean age of the respondents was 46.19 years with a standard deviation of 8.876, ranging from 28 to 63 years. The majority of respondents were female, accounting for 40 (62.5%) respondents, while male respondents accounted for 24 (37.5%) respondents. Regarding chemotherapy cycles, most respondents were in the middle phase (4–6 cycles), comprising 37 (57.8%) respondents. The majority of respondents also had no comorbidities, with 58 (90.6%) respondents. Breast cancer was the most common type of cancer, reported in 23 (35.9%) respondents, followed by lung cancer in 12 (18.8%) respondents and ovarian cancer in 8 (12.5%) respondents.

Cancer Related Fatigue

The results of the fatigue level analysis of the patients are presented in the following table:

Table no 2: Distribution of Mean Fatigue Levels in Cancer Patients (n=64)

Cancer Related Fatigue		
Score	Frequency (f)	Percentage (%)
41	2	3,1
42	1	1,6
43	2	3,1
44	1	1,6
45	8	12,5
46	9	14,1
47	11	17,2
48	11	17,2
49	3	4,7
50	16	25,0

Based on Table 2, the distribution of fatigue scores among the 64 respondents ranged from 41 to 50. The majority of respondents had a fatigue score of 50, comprising 16 (25.0%) respondents. Scores of 47 and 48 were observed in 11 (17.2%) respondents each, while a score of 46 was reported in 9 (14.1%) respondents.

IV. Discussion

The study results show that, demographically, the majority of respondents were female with a mean age of 46.19 years. Most were in the middle phase of chemotherapy, and the majority had no comorbidities. Breast cancer (35.9%) and lung cancer (18.8%) were the most prevalent types, consistent with the literature reporting a high prevalence of cancer-related fatigue (CRF) in breast and lung cancer patients during chemotherapy.

All respondents undergoing chemotherapy experienced severe fatigue, with CRF scores ranging from 41 to 50. The highest frequency was observed at a score of 50 (25% of respondents), followed by scores of 47 and 48 (17.2% each). These findings indicate that fatigue is a significant clinical problem in cancer patients during active therapy, aligning with previous studies that report CRF prevalence ranging from 58% to 90%, depending on cancer type and measurement methods.

Cancer-related fatigue (CRF) affects not only physical well-being but also the psychological and cognitive functioning of patients. Previous studies have shown that CRF can increase the risk of anxiety, depression, and emotional stress in cancer patients [(13)]. These data underscore the importance of comprehensive fatigue assessment using validated instruments, such as the Cancer Fatigue Scale (CFS), to understand the intensity and characteristics of fatigue experienced by patients.

V. Conclusion

Based on the results of this study conducted on cancer patients undergoing chemotherapy at dr. Zainoel Abidin Regional General Hospital, Banda Aceh, the majority of respondents experienced severe fatigue, with CRF scores ranging from 41 to 50. The highest fatigue level was observed at a score of 50, experienced by 25% of respondents, followed by scores of 47 and 48, each accounting for 17.2%. These results indicate that fatigue is a significant and common symptom in cancer patients during active therapy, affecting their physical, psychological, and cognitive well-being. Assessment of fatigue using the Cancer Fatigue Scale (CFS) proved essential to detect fatigue intensity and guide appropriate management. The findings highlight the need for focused nursing interventions to manage fatigue in cancer patients, enabling timely strategies to improve patients' quality of life during and after treatment.

Study Limitations: This study employed a descriptive cross-sectional design, which cannot establish causal relationships between factors influencing fatigue and the severity of CRF.
Recommendations: Future research is recommended using experimental or longitudinal designs to evaluate the effectiveness of interventions in reducing patient fatigue, including non-pharmacological interventions such as slow deep breathing exercises, light physical activity, or psychosocial therapy.
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