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# Anxiety levels among patients treated with chemotherapy at the Oncology Teaching Hospital in Baghdad city

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## Abstract

Chemotherapy may cause psychological effects such as anxiety, and the level of anxiety varies from one person to another.
Objective: This study aimed to assess the level of anxiety in patients treated with chemotherapy and to determine the relationships between anxiety levels and several variables, such as age and sex, level of education, and marital status. Method: A cross-sectional study was conducted from December 2022 to February 2023 at the Oncology Teaching Hospital in Baghdad city; the study involved 65 patients on the morning shift, and a questionnaire was used to measure anxiety levels (Anxiety Self-Rating Scale). The collected data were analyzed via SPSS V.23, which included descriptive statistical tests, frequencies, percentages, means, and chi-square tests for inferential analysis. Results: The results indicated that the majority of participants were women. (58.5%), aged between 39 and 48 years (30.8%) and diagnosed with breast cancer (41.5%). The highest percentages of anxiety (55.4%, 32.3%, and 12.3%) were moderate, mild, and extreme, respectively. Furthermore, the chi-square test revealed no statistically significant relationship between anxiety level and participants› demographic variables. Conclusion: This study revealed that patients had a moderate level of anxiety. There was no significant relationship between the level of anxiety of patients treated with chemotherapy and their demographic characteristics.

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## Introduction

Cancer is the uncontrolled growth of abnormal cells anywhere in the body. These abnormal cells are called cancer, malignant, or tumor cells. These cells can infiltrate normal body tissues. Many cancers and the abnormal cells that compose the cancer tissue are further identified by the name of the tissue from which the abnormal cells originated (for example, breast, lung and colorectal cancer). [1] Cancer affects people who are younger and older, richer and poorer, and has the same effect on men and women. This represents a large burden on patients, which increases for families and societies. Cancer is one of the leading causes of death worldwide, particularly in developing countries. Cancer is a dangerous and chronic disease that involves despair and ambiguity, painful death, anxiety, and fear and embarrassment. [2] However, chemotherapy is an effective treatment for cancer patients; it is used either for curing cancer, prolonging the patient's life, or as palliative care, and this depends on the stage of tumor progression and its type. [3]

Chemotherapy design depends on cell cycle kinetics and biochemical and pharmacological factors to reduce the signal transmission ability of cancer cells [4]. During the treatment of this disease, the patient's psychological condition deserves attention. It has been reported that up to 45% of cancer patients feel anxiety, and 25% suffer from depression. [5] One of the most common psychological symptoms among cancer patients is anxiety. This anxiety may appear before treatment begins and can persist or increase during chemotherapy. In this context, anxiety is related not only to the fear of illness or death but also to fears of loss of control, pain, altered self-image, and social isolation [6]. Anxiety is an emotion characterized by feelings of fear, dread, and uneasiness, alongside physical symptoms such as increased heart rate, tension, sweating, and restlessness. [6][7]

The level of anxiety and tension affects the body's response to pathological conditions and may disrupt all body processes. This constitutes a high-level threat to patients and patients' recovery, especially after chemotherapy, because of its effect on the body's vital activities and resistance to diseases. [8] [9] Identification of risk factors for anxiety, depression, and overall psychological distress in the early stages of cancer will allow the detection of high-risk patients and increase the likelihood of effective treatment. [8] Cancer patients often experience a range of psychological problems, including anxiety, mood disturbances, fear of recurrence, deterioration of self-concept, and concerns about body image from the beginning of diagnosis and during the first session of chemotherapy, which negatively affects the progress of treatment and the improvement of their physical condition in general. [10] Psychological status, including anxiety levels, plays an important role in the treatment process for cancer patients. Studies indicate that good psychological support can improve a patient's response to treatment and enhance their quality of life. Anxiety and depression are common symptoms among cancer patients and can negatively impact a patient's adherence to treatment plans, sleep, nutrition, and immunity, potentially leading to a deterioration in health. [11] Controlling anxiety through psychotherapy, social support, and relaxation techniques can help reduce pain and alleviate the side effects of chemotherapy or radiation. Therefore, incorporating psychological care into a comprehensive treatment plan for cancer patients is necessary, not an option, to ensure better outcomes and improve psychological and physical coping with the disease. The study objectives are assessing anxiety levels among patients treated with chemotherapy and determination of the relationships between demographic variables and patients' anxiety levels.

## Methods

A cross-sectional study was conducted from December 2022 to February 2023 with patients aged 18--65 years at the Oncology Teaching Hospital in Baghdad city. Sample: A purposive sample of 65 patients treated with chemotherapy was selected from the clinical outpatient department during the morning shift. The sample included males and females who agreed to participate in the study. Patients with a history of psychiatric conditions were excluded. After official approval from the hospital center is obtained, the study's aims are explained to the patients, who are informed that the information collected will be strictly confidential and used only for the study. All patients who participated in the study were asked to fill out the self-form of the anxiety score according to the [6][14] scale, as the participants completed the questionnaire in a quiet room without any disturbance, in addition to assistance from the researcher if there was any problem in understanding the questions.

**Tool of the Study:** A self-report questionnaire, which consists of two parts, was constructed to achieve the study objectives:

Part 1: Demographic characteristics of the patients, such as age, sex, marital status, and education level.

Part 2: Assessment related to anxiety level, which includes 10 items depending on self-rated anxiety scores according to [6][14]

where it was given for each item (never = 0) (sometimes = 1) (half time = 2) (frequently = 3) (always = 4), and the total score was 40 points.

The total points for the answers of patients were divided into the following categories: [13]

| No | Total score | Assess |
|---|---|---|
| 1 | 0-8 points | Minimal anxiety |
| 2 | 9-16 points | Mild anxiety |
| 3 | 17-24 points | Moderate anxiety |
| 4 | 25-32 points | (warning level) High anxiety |
| 5 | 33-40 points | (warning level) Extreme anxiety |

On the other hand, the patients took approximately 15–25 minutes to fill out the form at the outpatient unit. To measure the reliability of the questionnaire, items were used to test Cronbach's alpha test in a pilot study consisting of 10 patients excluded from the current research, and the results revealed that the questionnaire items reflected good reliability, with a value of 0.71.

**Statistical analysis** Descriptive statistics (frequency, percentages, means, SDs) and inferential statistics (chi-square) were used to examine the data to determine the associations between patients' age and sex at the time of chemotherapy and their level of anxiety. SPSS version 23 was used to compute the statistical methods.

**Table 1:** Distribution of the patients according to their demographic variables (n=65)

| Variables | Categories | F | % |
|---|---|---|---|
| Age/years | 18-27 | 13 | 20 |
| | 28-37 | 17 | 26.2 |
| | 38-47 | 20 | **30.8** |
| | 49 & over | 15 | 23.1 |
| Gender | Female | 38 | **58.5** |
| | Male | 27 | 41.5 |
| Level of Education | Reads and writes | 20 | **30.8** |
| | Primary School | 10 | 15.4 |
| | Secondary school | 10 | 15.4 |
| | diploma | 11 | 16.9 |
| | College | 14 | **21.5** |
| marital status | Single | 16 | 24.6 |
| | Married | 26 | 40 |
| | Widower | 11 | 16.9 |
| | **Divorced** | **12** | **18.5** |

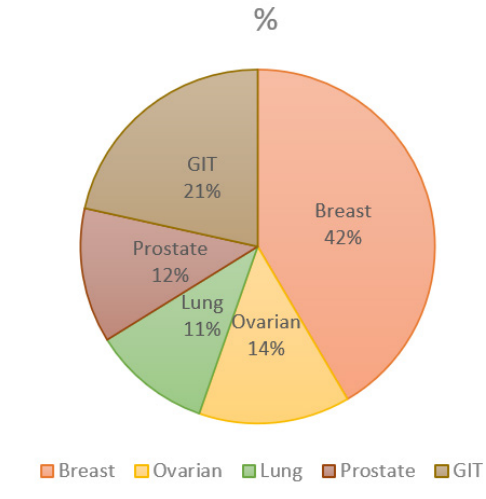


**Figure 1:** Percentage of patients diagnosed with different types of cancer

## Results

Table 1 shows the demographic and clinical characteristics of the study participants. The majority of participants (30.8%) were aged between 39 and 48 years. Females constituted a greater proportion of the sample (30.8%). In terms of educational attainment, 21.5% of the participants had completed a college-level education. Additionally, 40% of the participants were married. Regarding cancer types, 41.5% of the participants were diagnosed with breast cancer, making it the most prevalent type, followed by 21.5% who were diagnosed with gastrointestinal (GIT) cancer. This distribution is further depicted in Figure 1, which confirms that breast cancer had the highest incidence rate among the samples, followed by GIT cancer.

**Table 2:** Distribution of participants according to level of anxiety (n=65)

| Score level anxiety | Frequency | Percentage |
|---|---|---|
| Mild anxiety | 21 | 32.3 |
| Moderate anxiety | 36 | 55.4 |
| High anxiety | 8 | 12.3 |

25-32 points Table 2: For the participants suffering from anxiety, more than half of the study sample had a moderate level (55.4%), 32% had a mild level, and 12.3% had a high level of anxiety.

**Table 3:** Association between the level of anxiety and demographic data of patients

| Anxiety Level | Gender | | Total | $X^2$ |
|---|---|---|---|---|
| | **Male** | **Female** | | |
| | **F** | **F** | | |
| Mild | **8** | **13** | **21** | **0.86** |
| Moderate | **16** | **20** | **26** | |
| High | **3** | **5** | **8** | |
| Total | **27** | **38** | **65** | |

| Anxiety Level | Age | | | | Total | $X^2$ |
|---|---|---|---|---|---|---|
| | **18-28** | **29-38** | **39-48** | **49-over** | | |
| | **F** | **F** | **F** | **F** | | |
| Mild | **7** | **8** | **5** | **1** | **21** | **0.10** |
| Moderate | **4** | **8** | **12** | **12** | **36** | **NS** |
| High | **2** | **1** | **3** | **2** | **8** | |
| Total | **13** | **17** | **20** | **15** | **65** | |

| Anxiety level | **Education** | | | | | | **$X^2$** |
|---|---|---|---|---|---|---|---|
| | **Reads & writes** | **Primary School** | **Secondary school** | **diploma** | **College** | **Total** | |
| | **F** | **F** | **F** | **F** | **F** | | |
| Mild | **5** | **2** | **4** | **3** | **7** | **21** | **0.47** |
| Moderate | **13** | **7** | **6** | **6** | **4** | **36** | **NS** |
| High | **2** | **1** | **0** | **2** | **3** | **8** | |
| Total | **20** | **10** | **10** | **11** | **14** | **65** | |

| Anxiety level | marital status | | | | | $X^2$ |
|---|---|---|---|---|---|---|
| | Single | Married | Widower | Divorced | Total | |
| | F | F | F | F | | |
| Mild | 9 | 5 | 5 | 2 | 21 | 0.09 |
| Moderate | 6 | 17 | 6 | 7 | 36 | NS |
| High | 1 | 4 | 0 | 3 | 8 | |
| Total | 16 | 26 | 11 | 12 | 65 | |

**Table 4:** Relationships between patients' level of anxiety and type of cancer

| Anxiety Level Diagnosis (type of cancer) | X2 | Diagnosis (type of cancer) | | | | | |
|---|---|---|---|---|---|---|---|
| | Breast | Ovarian | Lung | Prostate | GIT | Total | $X^2$ |
| | F | F | F | F | F | | |
| Mild | 7 | 5 | 1 | 4 | 4 | 21 | 0.29 |
| Moderate | 15 | 4 | 6 | 4 | 7 | 36 | NS |
| High | 5 | 0 | 0 | 0 | 3 | 8 | |
| Total | 27 | 9 | 7 | 8 | 14 | 65 | |

(F=frequency) (NS=not significant)

Table 4 shows the relationship between the type of cancer and the level of anxiety, which reveals no association between them.

## Discussion

Table 1 shows the distribution of patients (total number 65) according to demographic variables, namely, age, sex, educational level, and marital status. The results revealed that the largest percentage of patients were in the 38–47 years age group (30.8%), indicating that this group was the most affected by the condition or disease under study. Females constituted the largest proportion of the sample (58.5%). This may be because women are more affected than men are, and women are more likely to seek healthcare than men are. The results of the present study are consistent with those of a study published in 2019, which was conducted with 216 participants and reported that most participants were women between the ages of 30 and 50 [7].

The educational level shows that a high percentage of patients read and write (30.8%) these findings agree with a study carried out in Turkey (Hui Shen, et al 2016) that showed a higher percentage of participants in primary school who were illiterate, which represents 48.8% of the study sample [1].

The results of the third table, which represent the distribution of anxiety levels among the patients included in the current study, revealed that patients with moderate anxiety levels represented the largest percentage of the sample, at 55.4%. This could indicate that moderate anxiety is more common among the individuals included in the study. While patients with mild anxiety constituted a smaller proportion of the sample (32.3%) than did those with moderate anxiety, they still represented a significant proportion of the participants. This level of anxiety can have tangible effects on individuals' lives and performance. Severe anxiety was relatively rare among the individuals included in the study, accounting for only 12.3% of the sample. However, severe anxiety is considered a serious level of anxiety and can require urgent intervention. The overall mean score is 1.80 for mild anxiety and 0.64 for mild anxiety (standard deviation), which indicates that the average anxiety for individuals in this category is relatively low. These findings indicate that the levels of anxiety in this category are relatively close to each other.

Therefore, these results clearly indicate that anxiety can be present at different levels among individuals, with moderate anxiety being the most common. These results are supported by a study conducted in Sudan in 2019, which differs from the current study in terms of the number of treatment doses received for chemotherapy. Patients who received 1–5 or more than 10 doses of chemotherapy suffered more psychological pressure than patients who received 6–10 doses of chemotherapy[7]

As shown in Fig. 1, the type of cancer with the highest percentage (42%) was breast cancer. followed by the GIT (21.5%). This result contrasts with that of Cardoso (2015), who reported that a high percentage of participants were diagnosed with gastrointestinal tract (GIT) colorectal can-

cer (27.2%), followed by lung (18.8%) and breast (17.6%) disease [1].

Finally, Table 4 shows that there was no significant difference in anxiety levels among the cases concerning their gender, age, and marital status at the $p > 0.05$ level. These results are consistent with those of a study published in 2021. This study included a sample of 100 cancer patients selected from the Marjan Medical City/Babylon Oncology Center. The study revealed no significant correlation between anxiety levels among patients treated with chemotherapy and sociodemographic characteristics such as age, sex, and marital status. This study differs from the results of the current study, which revealed a significant relationship between educational level and anxiety level at the 0.050 significance level. [1] The lack of a significant relationship between the level of anxiety and demographic variables may be because anxiety is more affected by psychological and clinical factors than by sex, educational level, or social status. Alternatively, the sample size may affect the results of the study, in addition to the level of culture or shyness. Therefore, there is a need for a more comprehensive and expanded study.

Conclusion: This study revealed that patients had a moderate level of anxiety. There was no significant relationship between the level of anxiety of patients treated with chemotherapy and their demographic characteristics. Researchers recommend that healthcare workers monitor the psychological state of patients treated with chemotherapy, especially before and after the start of treatment, and fully evaluate their psychological state and disorders. On the other hand, training patients on strategies for dealing with stress and anxiety, such as deep breathing and relaxation, also provides effective communication between members of the treatment team to ensure the exchange of information and cooperation in caring for patients and monitoring their psychological condition. Also focused on appropriate interventions to reduce or control anxiety among chemotherapy patients through individual sessions with psychological specialists or through educational programs.

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**Conflicts of interest:**
There are no competing interests.

**Author contributions:**
All stages of the study were fully supervised and implemented by the first researcher. (Batool K. Hussin)

**Ethical approval:**
Approval was obtained from the Middle Technical University Medical Ethics Committee, Al Za'franiya, Baghdad, Baghdad Governorate, P.C.: 10074, and patients' verbal consent to participate in the study was obtained after explaining the study's aims to the patients and informing them that the information collected would be strictly confidential and used only for the study.

## References

1. Hadi B, Abed RA, Al-Irayfawee NS, Hussein AF, Hasan TH. Assessing anxiety level among cancer patients. Ann Rom Soc Cell Biol. 2021 Apr 13;25(4):4134–44.
2. Hussin BK. Assess Nurses Knowledge Regarding Extravasation of Non-Cytotoxic Medication in Baghdad Teaching Hospital. Indian J Forensic Med Toxicol. 2021 Apr;15(2):2592–7.
3. Hussin BK, Razaq Ahmed WA. Nurses' knowledge about Management of Extravasation Intravenous Cytotoxic Medication at Amal National Hospital in Baghdad City. Indian J Forensic Med Toxicol. 2020 Jul;14(3):1806–10.
4. Dawood KS. Preoperative Anxiety and Fears among Adult Surgical Patients in Baghdad Teaching Hospital, Iraq. Med Leg Update. 2020 Jan;20(1):181–6.
5. Salim KS, Al Attar WM, Jassim RA, Abdullaa NT. Knowledge and awareness about breast cancer among male and female students in Al-Bayan University in Iraq. Ann Trop Med Public Health. 2020;23:23–103.
6. El Kheir DY, Ibrahim AH. Epidemiological assessment of distress during chemotherapy: who is affected?. J Taibah Univ Med Sci. 2019 Oct;14(5):448–53.
7. Liu H, Yang L. Dynamic change of depression and anxiety after chemotherapy among patients with ovarian cancer. Medicine (Baltimore). 2019 Aug;98(31):e16620.
8. Fadhil I, Hassan H. Evaluation of Nurses' Practices toward Safe Intravenous Chemotherapy Infusion in Baghdad City Hospitals. Iraqi Natl J Nurs Spec. 2018 Dec 30;31(2):43–56.
9. Cannioto RA, Trabert B, Poole EM, Schildkraut JM. Ovarian cancer epidemiology in the era of collaborative team science. Cancer Causes Control. 2017 May;28:487–95.
10. Li H, Jin D, Qiao F, Chen J, Gong J. Relationship between the Self-Rating Anxiety Scale score and the success rate of 64-slice computed tomography coronary angiography. Int J Psychiatry Med. 2016 Jan;51(1):47–55.
11. Nazik E, Arslan S, Nazik H, Narin M, Karlangic H, Koc Z. Anxiety and symptom assessment in Turkish gynecologic cancer patients receiving chemotherapy. Asian Pac J Cancer Prev. 2012;13(7):3129–32.
12. Olatunji BO, Deacon BJ, Abramowitz JS, Tolin DF. Dimensionality of somatic complaints: factor structure and psychometric properties of the Self-Rating Anxiety Scale. J Anxiety Disord. 2006;20(5):543–61.
13. Lindsay WR, Michie AM. Adaptation of the Zung self-rating anxiety scale for people with a mental handicap. J Intellect Disabil Res. 1988 Dec;32(6):485–90.
14. Zung WW. A rating instrument for anxiety disorders. Psychosomatics. 1971 Nov;12(6):371–9.