The Anxiety Level of Cancer Patients Undergoing Radiotherapy at Universitas Andalas Hospital

Assyifa Azzahra Dwi Trisno [1,2*], *Fathiya Juwita Hanum* [1,2], *Hendriati* [1,2], *Nelmi Silvia* [1,2], *Dian Pertiwi* [1,2], *Elmatris* [1,2]

[1] Faculty of Medicine, Universitas Andalas, Padang, Indonesia
[2] Department of Radiation Oncology, Universitas Andalas Hospital, Padang, Indonesia

ARTICLE INFO

ABSTRACT

Background: Radiotherapy is one of the most commonly used treatments for cancer. Radiotherapy works by using high-energy particles or waves, such as X-rays, gamma rays, electron beams, or protons, to destroy or damage cancer cells. Anxiety is an emotional response that arises when a person experiences stress. Patients diagnosed with cancer will experience anxiety, and the anxiety increases in patients undergoing radiotherapy. Anxiety in radiotherapy generally occurs due to a lack of information, side effects of treatment, and radiation procedures. This study aims to determine the description of the anxiety level of cancer patients undergoing radiotherapy at Universitas Andalas Hospital.

Method: This study is a quantitative descriptive study with a cross-sectional approach that examines the description of the anxiety level of cancer patients undergoing radiotherapy at Universitas Andalas Hospital. Anxiety levels were measured using the State Trait Anxiety Inventory (STAI) questionnaire.

Results: The sample in this study was 62 cancer patients undergoing radiotherapy. The results of the study were obtained in the A-State section, 64.5% experienced mild anxiety, 27.4% experienced moderate anxiety, and 8.1% experienced severe anxiety. The results of the A-Trait section 53.2% experienced mild anxiety, 43.6% experienced moderate anxiety, and 3.2% experienced severe anxiety. The trait section of anxiety tends to be more severe than the state section.

Conclusion: The anxiety level of cancer patients undergoing radiotherapy at Andalas University Hospital, A-State, and A-Trait is mostly at a mild level. The results of the study can be used as a source of information to consider a psychological approach to patient treatment. However, further researchers can analyze the relationship between variables that influence the level of anxiety.

Corresponding Author:
Assyifa Azzahra Dwi Trisno
Faculty of Medicine, Universitas Andalas, Padang, Indonesia
assyifatrisno2002@gmail.com

INTRODUCTION

Anxiety is an emotional response that arises when someone experiences stress. The level of anxiety experienced by each person varies depending on the factors that trigger it, leading to different physical responses in each individual. Anxiety is an inherent factor common to humans; however, it has a linear relationship with a decrease in the immune system. Radiotherapy is one of the most commonly used treatments for cancer, employing high-energy particles or waves such as X-rays, gamma rays, electron beams, or protons to destroy or damage cancer cells. This radiation causes small damage to the DNA in cells, which prevents cancer cells from growing and dividing, ultimately causing them to die [1,2].

Radiotherapy can provoke mental stress and anxiety, foster anger and hostility, and reduce quality of life. Additionally, changes in mental condition can influence the course of the disease [3]. Literature shows that 30% of patients diagnosed with cancer will experience anxiety, increasing to 40% in those undergoing radiotherapy [4]. A study by Lewis et al. [5] in Belgium explained that anxiety or fear can be a significant obstacle to treatment. This study also reported that 10–20% of patients felt

anxiety before radiotherapy, and 20-50% felt anxiety on their first day of treatment [5]. According to Radojevic et al. [6], anxiety during radiotherapy generally arises due to a lack of information, treatment side effects, and radiation procedures [6]. Sehlen et al. [7] also confirmed that most patients experience anxiety due to radiation therapy's side effects. Furthermore, research conducted by Rahman [8] at Dharmais Cancer Hospital found that anxiety levels in cancer patients undergoing radiotherapy were mild (65%), moderate (19%), and severe (16%). Another study by Ariani et al. [9] at RSUP Prof. Dr. I.G.N.G. Ngoerah revealed that 87% of patients experienced mild anxiety.

Doctors and nurses often overlook clinically relevant anxiety in oncology patients, assuming that emotional responses are appropriate. Therefore, identifying anxiety in cancer patients at an early stage is essential, as this issue is linked to both the illness and the ongoing treatment. Anxiety can negatively affect treatment compliance and significantly impact quality of life [10].

Data from Universitas Andalas Hospital indicate that at least 70-80 patients undergo radiotherapy there daily. Universitas Andalas Hospital prioritizes oncology as a key focus area, facilitating access to optimal treatment for cancer patients. This illustrates the high demand for identifying and assessing anxiety levels in patients undergoing radiotherapy [11]. Given this context, the researcher is interested in investigating the levels of anxiety experienced by cancer patients undergoing radiotherapy at Universitas Andalas Hospital.

METHODS

This was a quantitative descriptive research with a cross-sectional approach. The research was conducted from January to February 2024 at the Oncology Radiation Installation of Universitas Andalas Hospital. The sample used in this study was cancer patients undergoing radiotherapy who had no decline in medical health, including alert consciousness and no communication disorders. The total research sample was 62 participants, and the sampling technique used in this research was purposive sampling. The sample characteristics in this research include age, gender, last education of the participant, marital status, occupation, and cancer location.

This research used primary data obtained through questionnaires and processed by using IBM SPSS Statistics for Windows. The instrument used was a questionnaire sheet regarding anxiety levels. The anxiety level questionnaire used in this research is the State-Trait Anxiety Inventory (STAI) questionnaire developed by Spielberger in 1968, with validity test results of 0.6 and reliability test results of 0.9. This questionnaire has 2 parts: the A-State part explains the state of anxiety in certain conditions, and the A-Trait part explains the

general perceived conditions, each of which has 20 statements.

This research has passed the ethical review conducted by the ethics code team of the Faculty of Medicine, Andalas University, and each participant in the research has agreed to take part in the author's research.

RESULTS

A total of 62 participants were cancer patients undergoing radiotherapy at the Radiation Oncology Installation of Universitas Andalas Hospital. In this research, based on **Table 1**, it was found that the age of the participants was between 22 and 66 years, and most of the participants came from the age group of 20–44 years (46.8%). The sample was dominated by women (75.8%), most of whom did not work (48.4%), were married (83.9%), and had a high school education (42%). The most common type of cancer found in the sample was breast cancer (32.3%). Other cancers in this study sample consisted of gynecology, head and neck, respiratory/thoracic, gastrointestinal, musculoskeletal, and skin cancers.

Based on the STAI questionnaire, the state section described that 64.5% of the participants experienced mild anxiety, 27.4% of them underwent moderate anxiety and 8.1% with severe anxiety. The trait section showed that 53.2% of the participants experienced mild anxiety, 43.6% moderate anxiety, and 3.2% severe anxiety **(Table 2)**.

DISCUSSION

Based on research conducted at the Radiation Oncology Installation at Universitas Andalas Hospital regarding the description of the anxiety level of cancer patients undergoing radiotherapy, based on the results of the research in **Table 1** regarding the distribution of respondent characteristics, it was found that the frequency of characteristics based on gender, the majority of whom were women, was 47 people (75.8%). This aligns with a broader trend in oncology research, where women tend to have higher participation rates in such studies, likely due to the prevalence of cancers such as breast cancer, which predominantly affects women. These findings are consistent with research by Neelam Sharma [12], who also observed a higher proportion of female participants in her study on anxiety levels in cancer patients.

The majority of respondents were aged 20-44 years, accounting for 29 people (46.8%). This is significant, as cancer diagnoses and treatments tend to bring unique psychological challenges to younger adults, who are often still in their productive years, balancing careers, families, and other responsibilities. This finding is consistent with research by Sholikhah et al. [13], who

Table 1. Sample characteristics

Characteristics	Frequency (n = 62)	(%)
Gender		
Male	15	24.2
Female	47	75.8
Age (year)		
20–44	29	46.8
45–59	21	33.9
> 60	12	19.3
Last education		
Primary school	9	14.5
Junior high school	9	14.5
Senior high school	26	42
Bachelor/ S1	18	29
Marital status		
Marry	52	83.9
Divorced	4	6.4
Unmarried	6	9.7
Occupation		
PNS/TNI/Polri/BUMN/BUMD	11	17.7
Unemployed	30	48.4
Self-employed	4	6.5
Farmers	7	11.3
Private employee	7	11.3
Laborer/driver/helper	2	3.2
Other	1	1.6
Cancer location		
Breast	20	32.3
Gastrointestinal	6	9.7
Gynecology	15	24.2
Head and neck	8	12.9
Musculoskeletal	3	4.8
Respiratory	8	12.9
Skin	2	3.2

Table 2. Anxiety levels in cancer patients undergoing radiotherapy in Universitas Andalas Hospital

Anxiety Levels	Frequency (n = 62)	(%)
STAI - State		
Mild anxiety	40	64.5
Moderate anxiety	17	27.4
Severe anxiety	5	8.1
STAI - Trait		
Mild anxiety	53.2	53.2
Moderate anxiety	27	43.6
Severe anxiety	2	3.2

STAI = State Trait Anxiety Inventory

found that most of their respondents were under 55 years old, a key age group where anxiety related to cancer and its treatment may be heightened due to the life stage challenges they face.

In terms of education, 26 respondents (42%) were high school graduates, with the remainder having varying levels of education, including those with higher education degrees (25%) and lower educational attainment (33%). These results align with the findings of Yang et al. [14], where high school graduates made up the largest educational group in studies involving cancer patients.

Regarding marital status, the majority of participants were married, accounting for 52 respondents (83.9%), while 6 were unmarried (9.7%) and 4 were divorced or widowed (6.5%). These findings are consistent with the research by Yang et al. [14], which also found that most respondents were married. Marriage or being in a long-term relationship may provide cancer patients with emotional and social support, which can help reduce anxiety during treatment. However, the absence of a spouse or partner, as seen in unmarried or widowed participants, can contribute to heightened levels of anxiety due to feelings of isolation.

Employment status also had a noticeable impact on the patient population. Thirty respondents (48.4%) were unemployed, which included housewives and retirees. This is consistent with research by Neelam Sharma [12], which found that many cancer patients, especially women, were either housewives or unemployed. Unemployment, especially for patients of working age, can contribute to stress and anxiety, as financial concerns and uncertainties about returning to work after treatment may be major factors. Meanwhile, patients who are employed may face anxiety related to balancing treatment with work responsibilities.

The frequency distribution of respondent characteristics based on cancer location was mostly found in breast cancer patients as many as 20 people (32.3%). These results are in line with research conducted by Sholikhah et al. [13], which found that the largest number of respondents were patients diagnosed with breast cancer. These results are also in line with GLOBOCAN data in 2020 and RISKESDAS in 2018, which show that breast cancer is the most commonly recorded type of cancer at this time.

The research results obtained in this study showed that the highest level of anxiety felt by respondents was a mild level of anxiety for the A-State and A-Trait sections. These results are in line with research conducted by Ariani et al. [9] investigating prevalence of anxiety in cancer patients undergoing radiotherapy who used the Back Anxiety Inventory (BAI) instrument in Bali and Arif Rahman [8] research about internal factors related to anxiety levels who used the Depression Anxiety Stress Scale (DASS) instrument in Jakarta which got the most results at mild anxiety levels.

However, different results were obtained in research in Surabaya conducted by Sholikhah et al. [13], which used the same instrument as this study, which showed that the majority of respondents experienced severe anxiety. There are Many factors associated with anxiety in cancer patients, such as physical, psychological, social, environmental, age, side effects of treatment, hormonal changes, and social support [4]. Thus, the difference in anxiety levels felt by each patient depends on the factors aggravating it.

There is a difference in the results between the A-State and A-Trait sections, where the trait section, which shows the patient's anxiety in general conditions, is higher than the results of the state section, which describes anxiety in the current condition. This result can occur because the environment created in the oncology unit is very positive, therefore, the patients feel more comfortable and safe in carrying out treatment. The role of peer group support is also very helpful for patients in undergoing a series of radiotherapy sessions. This is following research by Tan et al. [15], which explains that peer group support greatly influences patient adaptation to quality of life and anxiety.

The limitation of this research is that this research only looked at anxiety in patients undergoing radiotherapy without considering other treatments that had been or were being carried out by the respondent. This research also does not consider other factors that might influence the respondent's anxiety.

CONCLUSIONS

Most cancer patients who underwent radiotherapy were female, aged 20–44 years, had a high school education, were married, did not work, and were patients with a diagnosis of breast cancer. The anxiety level of cancer patients undergoing radiotherapy at Universitas Andalas Hospital, A-State, and A-Trait is at a mild anxiety level.

It is recommended to provide regular psychological counseling, enhance peer support programs, incorporate holistic care practices like relaxation techniques, and tailor interventions based on individual patient characteristics to effectively manage anxiety among cancer patients undergoing radiotherapy.

DECLARATIONS

Competing interest
The authors declare no competing interests in this study.

Ethics approval and consent to participate
This study had been approved by the Research Ethics Committee, Faculty of Medicine, Universitas Andalas, number 39/UN.16.2/KEP-FK/2024.

REFERENCES

1. Gianfaldoni S, Gianfaldoni R, Wollina U, et al. An Overview on Radiotherapy: From Its History to Its Current Applications in Dermatology. Open Access Maced J Med Sci. 2017;5:521.

2. FitzGerald TJ, Bishop-Jodoin M, Laurie F, et al. Radiation Therapy. Cancer Prev Early Detect Treat Recover. 2022:447–61.

3. Braeken APBM, Kempen GIJM, Eekers DBP, et al. Psychosocial screening effects on health-related outcomes in patients receiving radiotherapy. A cluster randomised controlled trial. Psychooncology. 2013;22:2736–46.

4. Antoni D, Vigneron C, Clavier JB, et al. Anxiety during radiation therapy: A prospective randomized controlled trial evaluating a specific one-on-one procedure announcement provided by a radiation therapist. Cancers (Basel). 2021;13.

5. Lewis F, Merckaert I, Liénard A, et al. Anxiety and its time courses during radiotherapy for non-metastatic breast cancer: A longitudinal study. Radiother Oncol. 2014;111:276–80.

6. Radojevic MZ, Folic M, Jankovic S. A Questionnaire for Assessing Fear of Radiotherapy in Oncology Patients. Serbian J Exp Clin Res. 2018;19:57–63.

7. Sehlen S, Fahmüller H, Herschbach P, et al. Psychometrische Eigenschaften des Stress Index RadioOnkologie (SIRO)--ein neuer Fragebogen zur Erfassung der Lebensqualität bei Patienten unter Strahlentherapie [Psychometric properties of the Stress Index RadioOncology (SIRO)—a new questionnaire measuring quality of life of cancer patients during radiotherapy]. Strahlenther Onkol. 2003 Apr;179(4):261-9.

8. Rahman A. Faktor-faktor internal yang memengaruhi kepatuhan pasien dalam menjalani pengobatan hipertensi di Puskesmas Kecamatan Pasar Rebo Jakarta Timur [Skripsi]. Depok: Program Studi Sarjana, Fakultas Ilmu Keperawatan, Universitas Indonesia; 2013.

9. Ariani NKP, Lesmana CBJ, Pasaribu ILM, Pritiariesti NWP. Prevalence of anxiety in cancer patients undergoing radiotherapy at Sanglah hospital in 2022. Int J Heal Med Sci. 2022;5:370–6.

10. Goerling U, Hinz A, Koch-Gromus U, et al. Prevalence and severity of anxiety in cancer patients: results from a multi-center cohort study in Germany. J Cancer Res Clin Oncol. 2023;149:6371–9.

11. RS Unand - RS Unand Launching Layanan Radioterapi n.d. http://rsp.unand.ac.id/artikel/rs-unand-launching-layanan-radioterapi (accessed November 3, 2023).

12. Neelam Sharma AP. Prevalence of anxiety and depression in cancer patients during radiotherapy A rural Indian perspective. J Cancer Res Ther. 2020;17:219–23.

13. Sholikhah DU, Kurniawan VE, Fiddaroini FN. The The Relationship Of Nurse's Effective Communication Patterns To Anxiety Level Among Carcinoma Patients Undergoing External Radiotherapy At Adi Husada Cancer Center Surabaya. J Keperawatan Dan Fisioter. 2023;5:260–7.

14. Yang L, Yang J, He J, et al. Analysis of Anxiety and Depression Status in Patients Undergoing Radiotherapy During the COVID-19 Epidemic. Front Psychiatry. 2021;12:1–6.

15. Tan Y, Qin M, Liao B, et al. Effectiveness of Peer Support on Quality of Life and Anxiety in Breast Cancer Patients: A Systematic Review and Meta-Analysis. Breast Care. 2023;18:49–59.