JOURNAL OF MENTAL HEALTH AND BEHAVIORAL SCIENCES
Jan-June 2025, VOL. 3, ISSUE 1, pp. 1-7
https://doi.org/10.61577/jmhbs.2025.100001

RESEAPRO JOURNALS

ORIGINAL ARTICLE

OPEN ACCESS

# Anxiety and depression among cancer patients at B.P. Koirala Memorial Cancer Hospital, Chitwan, Nepal

**Bibika Pandit[1] and Dev Bandhu Poudel[2,3,4,5]**

[1]Department of Haematology, Peter MacCallum Cancer Center, Melbourne, Australia.
[2]Department of Humanities and Social Sciences, G. P. Koirala Memorial (Community) College, Kathmandu, Nepal
[3]Department of Humanities and Social Sciences, Brooklyn College, Kathmandu, Nepal
[4]Rupy's International School (A-Level)—Cambridge Associate School, Kathmandu, Nepal
[5]Sambhavya Foundation, Lalitpur, Nepal

## ABSTRACT

**Background:** Cancer patients frequently experience significant psychological distress, including anxiety and depression, which adversely affects their quality of life. Various demographic and clinical factors may influence these conditions, but their specific impact on cancer patients in Nepal is not well understood.

**Objective:** This study aimed to assess the relationships between anxiety, depression, and demographic and clinical factors among cancer patients in Nepal.

**Methods:** A cross-sectional survey was conducted among 248 cancer patients aged 18-79 years at a hospital in Nepal. Anxiety and depression levels were measured using validated scales, and their associations with demographic variables (age, gender, marital status, education, employment, income, and geographic location) and clinical factors (cancer type, stage, and treatment modality) were analyzed.

**Results:** Anxiety and depression correlated positively. Depression increased with age, but anxiety did not. Patients with metastatic cancer, those with >2 monthly hospital visits, illiterate individuals, unemployed/homemakers and lower-income patients and metastatic cancer had significantly higher levels of anxiety and depression than their counterparts. However, gender, marital status, geographic location, treatment modality, cancer localization, diagnosis duration, hospitalization length, perceived treatment effect, and primary caregiver type showed no significant associations with anxiety and depression.

**Conclusion:** The findings highlight the need for targeted mental health support in oncology care, especially for high-risk groups. Future research should explore effective psychological interventions, coping strategies, and long-term mental health trends to improve patient well-being.

## KEYWORDS

Anxiety; Cancer; Depression; Psychological distress; Psycho-oncology

## ARTICLE HISTORY

Received 17 January 2025;
Revised 18 February 2025;
Accepted 25 February 2025

## Introduction

Cancer imposes substantial physical, emotional, and financial urdens on patients, frequently resulting in increased levels of anxiety and depression [1]. Psychological distress in cancer patients is well-documented, with these individuals experiencing significantly higher rates of anxiety and depression than the general population. Factors contributing to this elevated distress include cancer stage, type, and demographic variables [2-9].

Studies highlight that awareness of a cancer diagnosis is generally correlated with increased psychological distress [10]. Anxiety and depression adversely affect the quality of life, with depression often having a stronger association with reduced quality of life than anxiety [2,11,12]. Psychological distress is more prevalent among younger patients; however, older adults may also experience heightened depression due to increased health concerns and social isolation [5,7,13,14]. Research on gender differences in psychological distress shows mixed results; some studies find no significant differences [9,10,15], while others report higher levels in females [4,16].

Marital status also shows varied effects on psychological distress, with some studies reporting no significant associations [5,10,14,18], while others indicate higher depression in single individuals [4], and increased anxiety and depression in married ones [19,20]. Advanced cancer stages are associated with higher anxiety and depression levels [4,21]. However, no significant differences in distress are found based on cancer localization or type [7,10], and different treatment modalities yield similar outcomes [10]. Moreover, hospitalization duration and relationships with primary caregivers do not significantly affect anxiety or depression levels [7,14].

Despite global research, there is limited understanding of how these psychological conditions affect cancer patients in Nepal. Data on anxiety and depression among Nepalese cancer patients are sparse, particularly regarding demographic characteristics, cancer stage, and treatment modalities. This study aims to fill this gap by examining the impact of these factors on anxiety and depression among

*Correspondence: Ms. Bibika Pandit, Department of Haematology, Peter MacCallum Cancer Center, Melbourne, Australia. Email: panditbibika@gmail.com

cancer patients in Nepal, providing insights for developing targeted mental health support and informing more effective interventions to improve their quality of life.

## Methods

### Participants

Participants in this study were cancer patients receiving treatment at B. P. Koirala Memorial Cancer Hospital, Chitwan, Nepal. The study focused on individuals aged 18 and older undergoing cancer treatment at the hospital. Using Del Águila formula for sample size calculation ($n=N/[1+Ne^2]$), with a population of 646 and a significance level of 0.05, a total sample of 248 was determined [22]. Participants with a history of psychiatric illness, current psychotropic medication, or incomplete data were excluded.

### Materials

The data collection tool was the validated Nepali version of the Hospital Anxiety and Depression Scale (HADS) [23,24], which assesses anxiety and depression in medical patients. We used the validated tool to minimize potential biases and ensure the tool's validity and reliability in the Nepali context. It consists of 14 items, seven for anxiety and seven for depression, rated on a four-point Likert scale. A score of ≥8 indicates symptoms of anxiety and/or depression. Reliability was measured using Cronbach's Alpha (α), and validity was ensured through content, construct, and criterion-related validity. The scale's translation and adaptation were verified for the Nepali context.

### Procedures

The research commenced with securing informed consent from all the participants, ensuring adherence to ethical standards and voluntary participation. Throughout the study, rigorous checks for completeness and consistency were implemented, with a continuous focus on ethical considerations such as protection from harm and adherence to guidelines, thereby maintaining the study's integrity and respecting participants' rights. Using randomized purposive sampling, cancer patients aged 18 and older from the hospital's outpatient and inpatient departments were recruited. Data collection occurred from July 28, 2022, to August 28, 2022, through face-to-face interviews where participants completed a comprehensive questionnaire, including demographic details and the Hospital Anxiety and Depression Scale (HADS).

During data collection, participants received detailed oral explanations and written consent forms about the study's objectives, procedures, and their rights, emphasizing confidentiality and the right to withdraw at any time. They independently completed the Hospital Anxiety and Depression Scale (HADS) with clear instructions, and any queries were promptly addressed. Data analysis utilized both descriptive and inferential statistics to examine demographic differences and relationships among variables. Welch's t-test was used for comparing means between two groups, while Welch's ANOVA was applied for comparing means among multiple groups to adjust for variability and homogeneity of variance. Hedge's g and partial eta squared ($\eta^2p$) were calculated to determine the effect size for the t-test and ANOVA [25,26]. Games Howell post hoc analysis identified specific group differences, and Cohen's d was reported to measure effect sizes [21]. Data analysis was conducted using Jeffery's Amazing Statistical Package (JASP), Google Sheets, and Excel. Manuscript preparation was completed in MS Word. For paraphrasing and language refinement, ChatGPT by OpenAI (2024) and Claude 3.5 Sonnet an AI assistant in the Claude 3 model family developed by Anthropic (2024) were used [27].

## Results

### Demographic information

The study included 248 cancer patients aged between 18 and 79 years, with a gender distribution of 47.18% female and 52.82% male. Most participants were married (81.05%), and educational backgrounds varied, with 17.34% having a bachelor's degree or higher. In terms of employment status, 43.55% were employed, 44.76% were homemakers, and 11.69% were unemployed. Geographically, 64.63% of participants were from the Terai region, while 35.37% were from Pahad. The income distribution showed that 40.32% earned more than 20,000, while 24.19% earned less than 5,000. Breast cancer (15.70%) and gastrointestinal cancer (22.87%) were the most common types, with 48.39% of patients having localized cancer. Regarding treatment, 61.81% underwent chemotherapy, and 38.18% received adjuvant therapy. The time since diagnosis varied: 33.87% were newly diagnosed, 31.05% within six months, and 24.19% had been diagnosed for over a year. Hospitalization duration ranged from one week (39.92%) to less than two visits per month (62.50%). Primary caregivers included spouses (44.96%), children (22.27%), parents (17.23%), and multiple caregivers (15.55%). Perceptions of treatment effectiveness varied, with 49.19% reporting improvement, 13.71% reporting no improvement, and 37.10% unsure. Anxiety levels were classified as abnormal (58.87%), borderline (30.24%), and normal (10.89%), while depression levels were reported as abnormal (49.19%), borderline (31.86%), and normal (18.95%).

### Anxiety and depression

A strong positive correlation was found between anxiety and depression ($r = 0.72$, $p < 0.001$).

### Anxiety and depression based on age

There was no significant relationship between age and anxiety ($r = 0.76$, $p = 0.234$) and a significant relationship between age and depression ($r = 0.2$, $p = 0.002$). Multiple regression analysis examined the effects of anxiety and depression on age, showing a statistically significant model ($F(2, 245) = 5.97$, $p = 0.003$, $R^2 = 0.04$), accounting for 4.7% of the variance in age. Depression, but not anxiety, was a significant predictor of age ($b = 1.32$, $t(245) = 3.23$, $p = 0.001$), indicating that higher depression levels were associated with older age, while anxiety did not significantly predict age ($b = -0.55$, $t(245) = -1.48$, $p = 0.138$).

### Anxiety and depression based on gender

Welch's t-test showed no significant difference in anxiety levels between females ($N = 117$, $M = 11.37$, $SD = 3.68$) and males ($N = 131$, $M = 11.09$, $SD = 3.41$), $t(237.53) = 0.61$, $p = 0.543$. Similarly, no significant difference was found in depression levels between females ($N= 117$, $M = 10.09$, $SD = 3.46$) and males ($N = 131$, $M = 10.14$, $SD = 3.03$), $t(232.29) = -0.13$, $p = 0.901$.



https://doi.org/10.61577/jmhbs.2025.100001

## Anxiety and depression based on marital status

Welch's t-test found no significant difference in anxiety between married (N = 201, M = 11.16, SD = 3.64) and single/widowed/divorced/separated individuals (N = 47, M = 11.46, SD = 3.07), t (79.11) = -0.58, p = 0.559. Similarly, no significant difference was observed in depression between married (N = 201, M = 10.04, SD = 3.25) and single/widowed/divorced/separated individuals (N = 47, M = 10.42, SD = 3.15), t (70.77) = -0.75, p = 0.456.

## Anxiety and depression based on academic levels

Welch's ANOVA showed significant differences in anxiety levels among different educational groups: Illiterate (N = 67, M = 12.54, SD = 3.55), High school and below (N = 103, M = 10.74, SD = 3.15), Vocational training/Diploma (N = 35, M = 10.66, SD = 4.08), and Bachelor's degree and above (N = 43, M = 10.79, SD = 3.52); F (3, 96.82) = 4.24, p = 0.007, $\eta^2p$ = 0.057. Games-Howell post hoc comparisons indicated significant differences in anxiety levels between high school graduates and illiterate participants (p = 0.005, 95% CI [-0.94, -0.01], Cohen's d = -0.52) (Table 1). Depression levels also varied significantly among educational groups: Illiterate (N = 67, M = 11.36, SD = 3.49), High school and below (N = 103, M = 9.79, SD = 2.75), Vocational training/Diploma (N = 35, M = 9.51, SD = 3.62), and Bachelor's degree and above (N = 43, M = 9.44, SD = 3.14); F (3, 96.30) = 4.19, p = 0.008, $\eta^2p$ = 0.057. Post hoc comparisons showed significant differences between bachelor's degree holders and illiterate participants (p = 0.018, 95% CI [-1.13, -0.08], Cohen's d = -0.61), and between high school graduates and illiterate participants (p = 0.012, 95% CI [-0.92, -0.08], Cohen's d = -0.50) (Table 1).

**Table 1.** Games-Howell Post Hoc Comparisons of Anxiety and Depression across Education and Income.

| Comparison Groups | | Mean Difference | 95% CI for Mean Difference | | SE | t | df | P-value | Cohen's d |
|---|---|---|---|---|---|---|---|---|---|
| | | | Lower | Upper | | | | | |
| Education Level Anxiety | | | | | | | | | |
| Bachelor's degree and above | High school and below | 0.05 | -1.58 | 1.69 | 0.62 | 0.09 | 71.5 | 1 | 0.02 |
| | Illiterate | -1.75 | -3.55 | 0.06 | 0.69 | -2.53 | 90.25 | 0.062 | -0.5 |
| | Vocational training/ Diploma | 0.13 | -2.17 | 2.44 | 0.87 | 0.15 | 67.62 | 0.999 | 0.04 |
| High school and below | Illiterate | -1.8 | -3.19 | -0.41 | 0.53 | -3.37 | 129.06 | 0.005** | -0.52 |
| | Vocational training/ Diploma | 0.08 | -1.93 | 2.09 | 0.76 | 0.11 | 48.54 | 1 | 0.02 |
| Illiterate | Vocational training/ Diploma | 1.88 | -0.27 | 4.03 | 0.82 | 2.31 | 61.31 | 0.107 | 0.54 |
| Depression | | | | | | | | | |
| Bachelor's degree and above | High school and below | -0.35 | -1.79 | 1.1 | 0.55 | -0.63 | 70.28 | 0.923 | -0.11 |
| | Illiterate | -1.92 | -3.59 | -0.24 | 0.64 | -2.99 | 96.37 | 0.018* | -0.61 |
| | Vocational training/ Diploma | -0.07 | -2.12 | 1.97 | 0.78 | -0.09 | 67.87 | 1 | -0.02 |
| High school and below | Illiterate | -1.57 | -2.89 | -0.26 | 0.51 | -3.11 | 117.8 | 0.012* | -0.5 |
| | Vocational training/ Diploma | 0.27 | -1.51 | 2.05 | 0.67 | 0.41 | 48.09 | 0.977 | 0.09 |
| Illiterate | Vocational training/ Diploma | 1.84 | -0.12 | 3.81 | 0.75 | 2.47 | 66.94 | 0.073 | 0.58 |
| Based on Income Anxiety | | | | | | | | | |
| (11000-20000) | (6000-10000) | 1.36 | -0.37 | 3.09 | 0.66 | 2.07 | 66.85 | 0.172 | 0.4 |
| | <5000 | -1.41 | -2.91 | 0.08 | 0.57 | -2.46 | 108.19 | 0.072 | -0.41 |
| | >20000 | -0.98 | -2.37 | 0.4 | 0.53 | -1.85 | 135.93 | 0.256 | -0.29 |



https://doi.org/10.61577/jmhbs.2025.100001

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| (6000-10000) | <5000 | -2.78 | -4.61 | -0.94 | 0.7 | -3.98 | 78.1 | < .001*** | -0.81 |
| | >20000 | -2.35 | -4.09 | -0.6 | 0.66 | -3.53 | 74.22 | 0.004** | -0.68 |
| <5000 | >20000 | 0.43 | -1.09 | 1.95 | 0.58 | 0.74 | 136.22 | 0.882 | 0.13 |
| Depression | | | | | | | | | |
| (11000-20000) | (6000-10000) | 0.88 | -0.62 | 2.39 | 0.57 | 1.54 | 70.73 | 0.418 | 0.28 |
| | <5000 | -1.72 | -3.19 | -0.24 | 0.56 | -3.04 | 105.16 | 0.015* | -0.55 |
| | >20000 | -0.94 | -2.18 | 0.3 | 0.48 | -1.97 | 131.31 | 0.204 | -0.3 |
| (6000-10000) | <5000 | -2.6 | -4.29 | -0.91 | 0.64 | -4.04 | 88.33 | < .001*** | -0.83 |
| | >20000 | -1.82 | -3.32 | -0.33 | 0.57 | -3.2 | 76.07 | 0.011* | -0.58 |
| <5000 | >20000 | 0.78 | -0.68 | 2.24 | 0.56 | 1.39 | 120.18 | 0.51 | 0.25 |

*p < 0.5, **p < 0.01, ***p < 0.001. Note. P-value and confidence intervals adjusted for comparing groups (confidence intervals corrected using the Tukey method).

## Anxiety and depression based on employment status and income

A Welch's t-test revealed significant differences in anxiety levels between unemployed/homemakers (N = 140, M = 11.65, SD = 3.54) and employed participants (N = 108, M = 10.67, SD = 3.5), t (232.15) = -2.19, p = 0.029, Cohen's d = -0.28. Anxiety levels also differed significantly among income groups: below 5000 (N = 60, M = 12.10, SD = 3.40), 6000-10000 (N = 37, M = 9.32, SD = 3.30), 11000-20000 (N = 51, M = 10.69, SD = 2.64), and above 20000 (N = 100, M = 11.67, SD = 3.84); F (3, 112.83) = 6.38, p < 0.001, $\eta^2p$ = 0.069. Post hoc comparisons showed significant differences between those earning less than 5000 and those earning 6000-10000 (p < 0.001, 95% CI [-4.61, -0.94], Cohen's d = -0.81), and between those earning 6000-10000 and above 20000 (p = 0.004, 95% CI [-4.092, -0.60], Cohen's d = -0.68) (Table 1).

Similarly, significant differences in depression levels were found between unemployed/homemakers (N = 140, M = 10.52, SD = 3.33) and employed individuals (N = 108, M = 9.58, SD = 3.03), t (239.35) = -2.31, p = 0.022, Cohen's d = -0.29. Depression levels also varied among income groups: below 5000 (N = 60, M = 11.17, SD = 3.48), 6000-10000 (N = 37, M = 8.57, SD = 2.80), 11000-20000 (N = 51, M = 9.45, SD = 2.43), and above 20000 (N = 100, M = 10.39, SD = 3.34); F (3, 244) = 6.28, p < 0.001, $\eta^2p$ = 0.072. Post hoc comparisons showed significant differences between those earning 11000-20000 and below 5000 (p = 0.015, 95% CI [-3.19, -0.24]), Cohen's d = -0.55 between those earning 6000-10000 and below 5000 (p < 0.001, 95% CI [-4.29, -0.91]), Cohen's d = -0.83 and between those earning 6000-10000 and above 20000 (p = 0.011, 95% CI [-3.32, -0.33]) , Cohen's d= -0.58.

## Anxiety and depression based on geographic location

A t-test revealed no significant difference in anxiety levels between individuals from Pahad (N = 87, M = 11.37, SD = 3.01) and Terai (N = 159, M = 11.13, SD = 3.8), t (213.06) = 0.55, p = 0.584. Similarly, there was no significant difference in depression levels between individuals from Pahad (N = 87, M = 9.94, SD = 2.91) and Terai (N = 159, M = 10.20, SD = 3.39), t (200.86) = -0.61, p = 0.54.

## Anxiety and depression based on localization and types of cancer

No significant differences in anxiety were found among patients with different types of cancer: breast cancer (N = 35, M = 11.00, SD = 2.68), ear, nose, and throat cancer (N = 36, M = 12.00, SD = 3.61), gastrointestinal cancer (N = 51, M = 10.67, SD = 4.26), gynecological cancer (N = 32, M = 11.16, SD = 4.65), thoracic cancer (N = 32, M = 10.69, SD = 2.10), and urogenital cancer (N = 37, M = 12.11, SD = 3.03); F (5, 98.47) = 1.58, p = 0.179. However, a significant difference in anxiety was found between patients with localized (N = 120, M = 10.51, SD = 3.81) and metastatic cancer (N = 128, M = 11.89, SD = 3.13), t (230.62) = -3.11, p = 0.002, Cohen's d = -0.40.

Similarly, no significant differences in depression were found among different cancer types: breast cancer (N = 35, M = 9.74, SD = 2.50), ear, nose, and throat cancer (N = 36, M = 10.97, SD = 3.24), gastrointestinal cancer (N = 51, M = 10.16, SD = 4.08), gynecological cancer (N = 32, M = 9.88, SD = 4.09), thoracic cancer (N = 32, M = 9.44, SD = 2.17), and urogenital cancer (N = 37, M = 10.65, SD = 2.45); F (5, 98.56) = 1.60, p = 0.165. However, a significant difference was observed in depression levels between localized (N = 120, M = 9.59, SD = 3.61) and metastatic cancer patients (N = 128, M = 10.60, SD = 2.76), t (222.41) = -2.46, p = 0.015, Cohen's d = -0.31.

## Anxiety and depression based on treatment modality and perceived treatment effect.

A Welch's t-test revealed a non-significant difference in anxiety between individuals undergoing adjuvant therapy (N = 84, M = 11.41, SD = 4.48) and chemotherapy (N = 136, M = 10.91, SD = 2.83), t (124.37) = 0.36, p = .131. Similarly, Welch's ANOVA revealed a non-significant difference in anxiety based on the perceived treatment effect: improved (N = 122, M = 11.19, SD = 3.80), not improved (N = 34, M = 11.27, SD = 2.56) and unknown (N = 92, M = 11.25, SD = 3.52); F (2, 107.56) = 0.012, p = 0.989.

A Welch's t-test revealed a non-significant difference in depression between individuals undergoing adjuvant therapy (N = 84, M = 10.58, SD = 4.04) and chemotherapy (N = 136, M = 9.78, SD = 2.66), t (127.85) = 0.10, p = .234. Similarly, Welch's ANOVA revealed a non-significant difference in depression based on the perceived treatment effect: improved (N = 122, M = 9.76, SD = 3.14), not improved (N = 34, M = 10.29, SD = 2.66) and unknown (N = 92, M = 10.51, SD = 3.51); F (2, 98.76) = 1.41, p = 0.248.

## Anxiety and depression based on duration of cancer after diagnosis

Welch ANOVA revealed a non-significant difference in anxiety based on time since diagnosis among: newly diagnosed (N = 84, M = 10.49, SD = 3.59), below 6 months (N = 77, M = 11.60, SD



https://doi.org/10.61577/jmhbs.2025.100001

= 2.59), 1 year and over (M = 11.60, SD = 4.10), F (2, 160.77) = 2.87, p = .06. Welch's ANOVA revealed a non-significant difference in depression among: newly diagnosed (N = 84, M = 9.56, SD = 3.18), below 6 months (N = 77, M = 10.05, SD = 2.60), 1 year and over (M = 10.70, SD = 3.70), F (2, 162.54) = 2.33, p = .1.

### Anxiety and depression based on duration of hospitalization or frequency of hospital visit in a month

Welch's ANOVA revealed a non-significant difference in anxiety based on the duration of hospitalization: one week (N = 99, M = 11.13, SD = 4.26), two weeks (N = 60, M = 10.73, SD = 3.33), three weeks (N = 56, M = 11.75, SD = 2.76), four weeks and above (N = 33, M = 11.49, SD = 2.56), F (3, 114.529) = 1.16, p = .325. In contrast, a Welch's t-test revealed a significant difference in anxiety between individuals with fewer than two hospital visits per month (N = 155, M = 10.81, SD = 3.39) and those with more than two visits (N = 93, M = 11.90, SD = 3.70), t (180.54) = -2.32, p = .022, Cohen's d = -0.308. Similar to anxiety, Welch's ANOVA revealed a non-significant difference in depression based on the duration of hospitalization: one week (N = 99, M = 10.02, SD = 3.82), two weeks (N = 60, M = 9.83, SD = 3.09), three weeks (N = 56, M = 10.55, SD = 2.27), four weeks and above (N = 33, M = 10.15, SD = 3.03), F (3, 108.26) = 0.8, p = .496. In contrast, a Welch's t-test revealed a significant difference in depression between individuals with fewer than two hospital visits per month (N = 155, M = 9.74, SD = 3.02) and those with more than two visits (N = 93, M = 10.74, SD = 3.48), t (172.92) = -2.31, p = .022, Cohen's d = -0.30.

### Anxiety and depression based on relation to primary caregivers

Welch's ANOVA revealed a non-significant difference in anxiety based on the primary caregiver: children (N = 53, M = 11.06, SD = 4.09), parents (N = 41, M = 11.37, SD = 2.44), spouse (N = 107, M = 11.21, SD = 3.54) and multiple caregivers (N = 37, M = 11.65, SD = 3.67); F (3, 100.23) = 0.20, p = .892. Welch's ANOVA revealed a non-significant difference in depression based on the primary caregiver: children (N = 53, M = 10.77, SD = 3.36), parents (N = 41, M = 9.66, SD = 2.38), spouse (N = 107, M = 9.78, SD = 3.18) and multiple caregivers (N = 37, M = 10.97, SD = 3.92), F (3, 97.89) = 2.10, p = .0104.

## Discussions

This study investigated the relationships between anxiety, depression, and various demographic factors among cancer patients. The results revealed a strong positive correlation between anxiety and depression, consistent with existing research on the high comorbidity of these conditions in cancer patients [3,28]. Depression, but not anxiety, significantly predicted age, with higher depression levels associated with older age. No significant differences in anxiety or depression levels were observed across gender, marital status, or geographic location. However, higher levels of anxiety and depression were linked to lower educational attainment, unemployment or homemaking status, and lower income. Anxiety and depression did not significantly differ by treatment modality or time since diagnosis but were notably higher in patients with metastatic cancer than in those with localized cancer.

The strong correlation between anxiety and depression observed in this study aligns with earlier findings that these conditions frequently co-occur in cancer patients due to the substantial emotional burden of a cancer diagnosis and the uncertainties surrounding disease progression and treatment outcomes [5,6]. The significant association between higher depression levels and older age may reflect increased health concerns and social isolation often experienced by older adults [5,13]. This finding aligns with other studies that highlight a heightened vulnerability to depression in older cancer patients, although some research has noted non-significant relationships between age and these conditions [9].

The lack of significant differences in anxiety and depression across genders suggests that psychological distress may affect male and female cancer patients similarly, contrary to studies indicating higher levels in females [4,16]. This might reflect cultural or regional variations in gender roles and expectations that influence psychological responses to cancer. Similarly, the absence of significant associations between marital status and psychological distress is in line with several studies [5,14], although others have reported higher depression levels among unmarried patients or mixed findings on the impact of marital status on anxiety [4,19].

Educational attainment was significantly associated with anxiety and depression levels, with illiterate individuals showing higher levels than those with higher education. This aligns with previous research linking lower education with greater psychological distress [19,29]. The finding that unemployed and homemaker participants reported higher anxiety and depression levels than employed individuals corroborates studies that suggest economic and social pressures contribute to psychological distress among unemployed patients [5,21]. However, some studies found no significant relationship between employment status and distress, indicating that this relationship might be context-dependent [9].

Income level was also significantly associated with anxiety and depression, with lower-income participants experiencing higher distress levels. This is partially consistent with Safaie et al., who reported that anxiety was significantly higher among low-income cancer patients, while depression did not show a significant association with income status. No significant differences in anxiety and depression were found between patients from different geographic regions [9], aligning with studies indicating no regional differences in psychological distress among cancer patients [30]. However, Risal et al. observed higher prevalence rates of anxiety and depression at higher altitudes, suggesting that specific environmental factors might contribute to these differences [31].

Anxiety and depression levels did not significantly differ based on the type of cancer, consistent with research indicating no significant differences in distress levels across various cancer localizations [10]. However, other studies have reported varying levels of psychological distress depending on cancer type, with certain cancers like lung and hematological cancers showing higher distress levels [3,32]. The finding that anxiety and depression levels were higher in patients with metastatic cancer compared to those with localized cancer suggests that cancer severity influences psychological outcomes. Advanced stages of



https://doi.org/10.61577/jmhbs.2025.100001

cancer have been associated with a greater emotional burden due to poorer prognosis and more aggressive treatment regimens [4,21].

The study's findings have important implications for clinical practice. Given the strong correlation between anxiety and depression among cancer patients, screening for both conditions should be a standard component of cancer care. Particular attention should be paid to older adults, lower-income patients, and those with metastatic cancer, who are at higher risk for psychological distress. Tailored psychological interventions, such as cognitive-behavioral therapy or psychosocial support programs, could help mitigate the adverse effects of anxiety and depression in these populations. Health practitioners should also consider demographic factors such as education and employment status when assessing psychological needs, as these variables are associated with varying levels of distress.

This study's strengths lie in its comprehensive approach to examining multiple demographic variables and their associations with anxiety and depression in a diverse group of cancer patients. The use of validated psychological scales and robust statistical methods enhances the reliability and validity of the findings. Additionally, the study fills a critical gap in the literature by providing insights into the psychological distress experienced by cancer patients in Nepal, a region with limited data on this topic [33].

The study's cross-sectional design limits its ability to establish causality between the identified factors and psychological distress. Additionally, the sample was drawn from a single hospital, which may limit the generalizability of the findings to other settings or populations. The relatively small sample size, although determined by power analysis, may not be adequate to detect all relevant associations. Moreover, cultural and environmental factors unique to Nepal may influence the findings, necessitating caution when applying the results to other populations.

Future studies should consider longitudinal designs to explore the temporal relationships between demographic factors and psychological distress in cancer patients. Expanding the research scope to multiple healthcare settings and including larger sample sizes would improve the generalizability of the findings. Research should also investigate the role of cultural, social, and environmental factors in shaping psychological outcomes among diverse cancer populations.

This study highlights the high prevalence of anxiety and depression among cancer patients, particularly older adults, lower-income individuals, and those with metastatic cancer. The findings underscore the importance of integrating targeted psychological interventions into cancer care to improve the quality of life for these vulnerable populations. Further research is needed to deepen our understanding of the complex interactions between demographic factors and psychological distress in cancer patients.

We found no significant difference in anxiety and depression levels between patients who underwent adjuvant therapy and those who received chemotherapy. A study found that 22% of patients had high levels before treatment began, 33% maintained baseline anxiety throughout the treatment, and 13% developed anxiety after 6 months of treatment. Regarding depression, 18% exhibited baseline depression, 24% had persistent depression throughout the treatment, and 13% developed depression after the treatment period [4]. This suggests that patients who experienced higher levels of anxious preoccupation during their treatment were more likely to experience increased psychological distress after treatment concluded.

We found no significant difference in the level of anxiety and depression among newly diagnosed, patients who were diagnosed since 6 months and those who were diagnosed since more than 1 year. Studies indicate that anxiety is highest in patients diagnosed over 10 years ago, while depression risk is highest in those diagnosed within the past 2 years and lowest in those diagnosed over 10 years ago. There is no significant difference in anxiety between patients diagnosed less than 2 years ago and those diagnosed 2–10 years ago [20,33].

Our study found no link between hospitalization duration and anxiety or depression in cancer patients. However, patients visiting the hospital more than twice a month had significantly higher anxiety and depression levels. Hartung et al. observed the highest depression in cancer rehabilitation patients, followed by those in inpatient oncology wards, with the lowest in outpatient clinics. Conversely, Hinz et al. reported that, while anxiety remained elevated during and up to three months post-hospitalization, depression scores at two weeks and three months were similar to those in the general population [21,7].

Our observation revealed no significant differences in anxiety or depression levels based on the relationship with primary caregivers. Consistently, research has found comparable level of psychological distress in caregivers as well [28].

## Conclusions

Cancer patients showed a strong correlation between anxiety and depression. Depression, but not anxiety, was significantly predicted by age, with older patients experiencing higher levels. Anxiety and depression were significantly higher in patients with metastatic cancer, frequent hospital visits, lower literacy, unemployment/homemaking roles, and lower income. In contrast, gender, marital status, geographic location, treatment modality, cancer localization, diagnosis duration, hospitalization length, perceived treatment effect, and primary caregiver type showed no significant impact. These findings highlight the need for targeted psychological support for high-risk groups. Future research should focus on effective interventions, coping mechanisms, and long-term mental health trends to enhance patient well-being.

## Acknowledgements

We sincerely acknowledge all the respondents for their participation and the authors whose work has been cited in this study.

## Disclosure Statement

No potential conflict of interest was reported by the authors.

## References

1. Liu CL, Liu L, Zhang Y, Dai XZ, Wu H. Prevalence and its associated psychological variables of symptoms of depression and anxiety



https://doi.org/10.61577/jmhbs.2025.100001

among ovarian cancer patients in China: a cross-sectional study. Health Qual Life Outcomes. 2017;15:1-11. https://doi.org/10.1186/s12955-017-0738-1
2. Akyol M, Ulger E, Alacacioglu A, Kucukzeybek Y, Yildiz Y, Bayoglu V, et al. Sexual satisfaction, anxiety, depression and quality of life among Turkish colorectal cancer patients [Izmir Oncology Group (IZOG) study]. Jpn J Clin Oncol. 2015;45(7):657-664. https://doi.org/10.1093/jjco/hyv051
3. Clinton-McHarg T, Carey M, Sanson-Fisher R, Tzelepis F, Bryant J, Williamson A. Anxiety and depression among haematological cancer patients attending treatment centres: prevalence and predictors. J Affect Disord. 2014;165:176-181. https://doi.org/10.1016/j.jad.2014.04.072
4. Velasco-Durantez V, Cruz-Castellanos P, Hernandez R, Rodriguez-Gonzalez A, Fernandez Montes A, Gallego A, et al. Prospective study of predictors for anxiety, depression, and somatization in a sample of 1807 cancer patients. Sci Rep. 2024; 14(1):3188. https://doi.org/10.1038/s41598-024-53212-y
5. Hadi N. The Prevalence of Anxiety and Depression in Adult Hospitalized Pa-tients in Internal and Surgical Wards of Shiraz Hospitals-1387. Shiraz E Med J. 2010;11(3):137-147. http://semj.sums.ac.ir/vol11/jul2010/88039.htm
6. Zhan ZJ, Huang HY, Xiao YH, Zhao YP, Cao X, Cai ZC, et al. Anxiety and depression in nasopharyngeal carcinoma patients and network analysis to identify central symptoms: A cross-sectional study from a high-incidence area. Radiother Oncol. 2024;197: 110324. https://doi.org/10.1016/j.radonc.2024.110324
7. Hinz A, Krauss O, Hauss JP, Höckel M, Kortmann RD, Stolzenburg JU, et al. Anxiety and depression in cancer patients compared with the general population. Eur J Cancer Care. 2010;19(4):522-529. https://doi.org/10.1111/j.1365-2354.2009.01088.x
8. Kalin NH. The critical relationship between anxiety and depression. Am J Psychiatry. 2020;177(5):365-367. https://doi.org/10.1176/appi.ajp.2020.20030305
9. Safaie N, Zeinali H, Ghahramanfard F, Mirmohammadkhani M, Moonesan M. Anxiety and depression among new cancer patients. J Family Med Prim Care. 2022;11(8):4146-4150. https://doi.org/10.4103/jfmpc.jfmpc_1984_21
10. Tavoli A, Mohagheghi MA, Montazeri A, Roshan R, Tavoli Z, Omidvari S. Anxiety and depression in patients with gastrointestinal cancer: does knowledge of cancer diagnosis matter? BMC Gastroenterol. 2007;7:1-6. https://doi.org/10.1186/1471-230X-7-28
11. Aminisani N, Nikbakht H, Jafarabadi MA, Shamshirgaran SM. Depression, anxiety, and health related quality of life among colorectal cancer survivors. J Gastrointest Oncol. 2017;8(1):81. https://doi.org/10.21037/jgo.2017.01.12
12. Midway S, Robertson M, Flinn S, Kaller M. Comparing multiple comparisons: practical guidance for choosing the best multiple comparisons test. PeerJ. 2020;8:e10387. https://doi.org/10.7717/peerj.10387
13. Goldzweig G, Baider L, Rottenberg Y, Andritsch E, Jacobs JM. Is age a risk factor for depression among the oldest old with cancer? J Geriatr Oncol. 2018;9(5):476-481. https://doi.org/10.1016/j.jgo.2018.03.011
14. Wilson KG, Chochinov HM, Skirko MG, Allard P, Chary S, Gagnon PR, et al. Depression and anxiety disorders in palliative cancer care. J Pain Symptom Manag. 2007;33(2):118-129. https://doi.org/10.1016/j.jpainsymman.2006.07.016
15. Jadoon NA, Munir W, Shahzad MA, Choudhry ZS. Assessment of depression and anxiety in adult cancer outpatients: a cross-sectional study. BMC cancer. 2010;10:1-7. https://doi.org/10.1186/1471-2407-10-594
16. Vahdaninia M, Omidvari S, Montazeri A. What do predict anxiety and depression in breast cancer patients? A follow-up study. Soc Psychiat Epidemiol. 2010;45:355-361. https://doi.org/10.1007/s00127-009-0068-7
17. Jan SL, Shieh G. Optimal sample sizes for Welch's test under various allocation and cost considerations. Behav Res Methods. 201;43: 1014-1022. https://doi.org/10.3758/s13428-011-0095-7
18. Kuczmarski TM, Jaung T, Mancuso CE, Mozessohn L, Roemer L, Abel GA, et al. Precancer and cancer-associated depression and anxiety among older adults with blood cancers in the United States. Blood Adv. 2022;6(4):1126-1136. https://doi.org/10.1182/bloodadvances.2021005862
19. Osborne RH, Elsworth GR, Hopper JL. Age-specific norms and determinants of anxiety and depression in 731 women with breast cancer recruited through a population-based cancer registry. Eur J Cancer. 2003;39(6):755-762. https://doi.org/10.1016/s0959-8049(02)00814-6
20. Mehnert A, Brähler E, Faller H, Härter M, Keller M, Schulz H, et al. Four-week prevalence of mental disorders in patients with cancer across major tumor entities. J Clin Oncol. 2014;32(31):3540-3546. https://doi.org/10.1200/JCO.2014.56.0086
21. Hartung TJ, Brähler E, Faller H, Härter M, Hinz A, Johansen C, et al. The risk of being depressed is significantly higher in cancer patients than in the general population: prevalence and severity of depressive symptoms across major cancer types. Eur J Cancer. 2017; 72:46-53. https://doi.org/10.1016/j.ejca.2016.11.017
22. Del Águila MR, González-Ramírez AR. Sample size calculation. Allergologia et immunopathologia. 2014;42(5):485-492. https://doi.org/10.1016/j.aller.2013.03.008
23. Risal A, Manandhar K, Linde M, Koju R, Steiner TJ, Holen A. Reliability and validity of a Nepali-language version of the hospital anxiety and depression scale (HADS). Kathmandu Univ Med J. 2015;13(2):115-124. https://doi.org/10.3126/kumj.v13i2.16783
24. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361-370. https://doi.org/10.1111/j.1600-0447
25. Hedges LV. Distribution theory for Glass's estimator of effect size and related estimators. J Educ Stat. 1981;6(2):107-128. https://doi.org/10.3102/10769986006002107
26. Salkind NJ, editor. Encyclopedia of research design. sage; 2010. https://doi.org/10.4135/9781412961288
27. Hosseini M, Resnik DB, Holmes K. The ethics of disclosing the use of artificial intelligence tools in writing scholarly manuscripts. Res Ethics. 2023;19(4):449-465. https://doi.org/10.1177/17470161231180449
28. Deshields TL, Asvat Y, Tippey AR, Vanderlan JR. Distress, depression, anxiety, and resilience in patients with cancer and caregivers. Health Psychol. 2022;41(4):246. https://psycnet.apa.org/doi/10.1037/hea0001170
29. Khalil A, Faheem M, Fahim A, Innocent H, Mansoor Z, Rizvi S, et al. Prevalence of Depression and Anxiety amongst Cancer Patients in a Hospital Setting: A Cross-Sectional Study. Psychiatry J. 2016; 2016(1):3964806. https://doi.org/10.1155/2016/3964806
30. Peltzer K, Pengpid S. Prevalence and Correlates of Depressive and Generalised Anxiety Symptoms Among Female Adolescents in Nepal: Results of a Cross-sectional National Population-Based Survey in 2022. Child Adolesc Soc Work J. 2024;1-3. https://doi.org/10.1007/s10560-024-00963-2
31. Risal A, Manandhar K, Linde M, Steiner TJ, Holen A. Anxiety and depression in Nepal: prevalence, comorbidity and associations. BMC psychiatry. 2016;16:1-9. https://doi.org/10.1186/s12888-016-0810-0
32. Linden W, Vodermaier A, MacKenzie R, Greig D. Anxiety and depression after cancer diagnosis: prevalence rates by cancer type, gender, and age. J Affect Disord. 2012;141(2-3):343-351. https://doi.org/10.1016/j.jad.2012.03.025
33. Mitchell AJ, Ferguson DW, Gill J, Paul J, Symonds P. Depression and anxiety in long-term cancer survivors compared with spouses and healthy controls: a systematic review and meta-analysis. The Lancet Oncol. 2013;14(8):721-732. https://doi.org/10.1016/S1470-2045(13)70244-4



https://doi.org/10.61577/jmhbs.2025.100001