ORIGINAL ARTICLE

Factors linked with depression and anxiety in adult patients diagnosed with breast cancer - A case study of Cancer Diseases Hospital, Lusaka, Zambia

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ABSTRACT

Background: Psychological distress is common among women diagnosed with breast cancer, particularly in low- to middle-income countries where mental health screening and psychosocial support services are limited. This study assessed the prevalence of anxiety and depression symptoms among women with breast cancer at Zambia's national cancer referral hospital and explored patient-identified causes of distress.

Methods: We conducted a hospital-based cross-sectional study among 113 women attending the Cancer Diseases Hospital in Lusaka, Zambia. Psychological distress was assessed using the 21-item Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI). Participants also responded to structured questions about the perceived causes of their emotional burden. Descriptive statistics with 95% confidence intervals (CIs) were used to estimate the prevalence of depression and anxiety. Reported causes of distress were categorised thematically.

Results: Nearly 70% of participants reported moderate-to-severe depression (69.1%, 95% CI: 60.1-77.1), and more than 60% experienced moderate-to-severe anxiety (61.9%, 95% CI: 52.6-70.4). Severe depression was observed in 31.9% (95% CI: 23.7-41.1), while severe anxiety was present in 26.5% (95% CI: 18.7-35.5). The most frequently cited sources of emotional distress were fear of death (66.4%), body image changes (45.1%), financial burden (39.8%), and uncertainty about treatment (35.4%).

Keywords: *anxiety, breast cancer, depression, mental health, and psychological distress*

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Conclusion: The study highlights a substantial burden of psychological distress among women with breast cancer in Zambia. Routine mental health screening using validated tools such as BAI and BDI, combined with responsive psychosocial support, should be prioritised in oncology care. Strengthening psycho-oncology services is crucial for enhancing patient well-being and treatment adherence in low-resource settings.

INTRODUCTION

Breast cancer remains one of the leading causes of morbidity and mortality among women worldwide and presents significant challenges in both physical and emotional domains [1]. The experience of cancer diagnosis, coupled with the physical demands of treatment, often leads to heightened emotional distress, particularly symptoms of anxiety and depression [2,3]. These mental health conditions are not only prevalent among breast cancer patients but have also been shown to negatively affect treatment adherence, quality of life, and even survival outcomes.

In Zambia, breast cancer is increasingly being diagnosed at advanced stages, which compounds the psychological burden on patients. Limited access to psychosocial services and mental health professionals further exacerbates this issue, leaving many women without the necessary support to navigate their cancer journey [4]. Although oncology services at the Cancer Diseases Hospital have expanded over the past decade, formal screening for mental health distress has not been routinely integrated into care protocols.

Zambia is one of the few countries still struggling with how to manage mental illness and treatment [5]. Zambia, as in many other low-income African countries, little attention is devoted to addressing the negative beliefs and behaviours surrounding mental illness, despite the devastating costs that ensue [6].

Evidence from sub-Saharan Africa suggests that up to 50% of cancer patients experience moderate to severe depressive symptoms, while anxiety is also likely highly prevalent [7,8]. These conditions often remain undiagnosed and untreated in oncology settings despite their negative implications for treatment adherence, quality of life, and clinical outcomes [8]. Routine psychological screening is rarely implemented in Zambian cancer care, highlighting a gap in the holistic management of patients [4], and this gap prompted this study.

Validated psychological assessment tools such as the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) are effective in detecting symptoms of emotional distress in cancer populations [9]. These tools allow for early identification of patients who may benefit from psychosocial interventions and have demonstrated acceptable reliability in various contexts, including African populations.

The study aimed to determine the prevalence and severity of depression and anxiety among women with breast cancer receiving care at the Cancer Diseases Hospital in Lusaka, Zambia, using the BDI and BAI. It also explored patient-reported sources of emotional distress to inform the integration of mental health support into oncology care in Zambia and similar low-resource settings.

METHODS

Study Design and Setting

This was a hospital-based, cross-sectional descriptive study conducted at the Cancer Diseases Hospital (CDH) in Lusaka, Zambia. CDH is the only specialised cancer treatment centre in the country, serving patients referred from all ten provinces.

Participants and Sampling

The minimum sample size was calculated using $n = \frac{Z2*p(1-p)}{d2}$ with z = 1.96, p = 0.50 to maximise variance and ensure a conservative estimate, and d = 0.09, yielding 107 participants. Allowing 5-10% for non-response, 113 participants were enrolled.

The study population consisted of women aged 18 and older with a confirmed diagnosis of breast cancer receiving care at CDH during the study period. A total of 113 participants were selected

through a raffle draw sampling method, designed to ensure random selection while maintaining feasibility in a busy clinical setting. Eligible participants were identified from clinical attendance registers, and those meeting the inclusion criteria were invited to draw folded slips from a container to determine participation. Women who selected a slip marked "Yes" were enrolled until the target sample size was achieved.

Inclusion criteria included willingness to participate, capacity to give informed consent, and ability to communicate in English or a local language. Women who were acutely unwell or unable to engage meaningfully in the interview were excluded from the study.

Data Collection Tools and Procedure

Data were collected using a structured, interviewer-administered questionnaire of three sections:

- Sociodemographic and clinical characteristics,
- The Beck Depression Inventory (BDI) – a 21-item tool for assessing depression severity [9],
- The Beck Anxiety Inventory (BAI) – a 21-item scale for measuring anxiety symptoms [9].

Both the BDI and the BAI are internationally validated tools that have demonstrated high reliability in oncology settings. Each item is scored on a 4-point Likert scale (0-3), with total scores categorised using established cut-offs from the Beck manuals: BDI (0-9 = normal, 10-18 = mild to moderate, 19-29 moderate to severe, 30-63 =severe) and BAI (0-7 = minimal, 8-15 = mild, 16-25 = moderate, 26-63 = severe) [9].

Data Management and Analysis

Data were entered and cleaned in Microsoft Excel, then exported to SPSS version 23 for cleaning and analysis. Descriptive statistics (frequencies, percentages, and means) were used to summarise participant characteristics and psychometric scores. Self-reported causes of distress were categorised thematically based on the frequency of similar responses.

To provide precision around prevalence estimates, 95% confidence intervals (CIs) were calculated for the proportions of the participants with depression and anxiety. CIs were derived using the formula:

$$CI = p \pm 1.96\sqrt{(p(1-p)/n)},$$

Where p is the observed proportion and n is the sample size (n = 113).

Ethical Considerations

The study received ethical approval from the Mulungushi Research Ethics Committee. Afterwards, permission to conduct the study was obtained from the research site, which was the Cancer Diseases Hospital in Lusaka. Written informed consent was obtained from all participants before data collection. Privacy and confidentiality were strictly maintained, and participants who were found to have severe anxiety or depression were referred to the hospital's psychosocial support team for follow-up care.

RESULTS

A total of 113 women participated in the study. Most were aged between 40 and 59 years (61.1%). More than half were married (63.7%) and had attained secondary education or higher (59.2%). About 44.2% were unemployed, and 38.9% had been on treatment for breast cancer for more than six months. Table 1 summarises the sociodemographic and clinical characteristics of the participants.

Table 1: Sociodemographic and Clinical Characteristics of Women with Breast Cancer at the Cancer Diseases Hospital, Zambia (N = 113. This table summarises participants' demographic and clinical features. Most were aged 40-59 years (61.1%), married (63.7%), and had at least secondary education (59.2%). Nearly half (44.2%) were unemployed, and 38.9% had been on treatment for more than six months.

Characteristic	**Frequency (n)**	**Percentage (%)**
Age (years)		
20-39	26	23
40-59	69	61.1
=60	18	15.9
Marital Status		
Single	13	11.5
Married	72	63.7
Widowed/Divorced	28	24.8
Education Level		
None/Primary	46	40.8
Secondary or higher	67	59.2
Employment Status		
Employed	63	55.8
Unemployed	50	44.2
Duration of Treatment		
=6 months	69	61.1
>6 months	44	38.9

Prevalence of Depression and Anxiety

Based on the Beck Depression Inventory (BDI), 69.1% of participants reported moderate-to-severe depressive symptoms, with 37.2% falling in the moderate to severe category and 31.9% classified as severely depressed. Only 14.2% were within the normal range, while 16.8% had mild symptoms of depression.

Similarly, the Beck Anxiety Inventory (BAI) showed that 61.9% of the participants experienced moderate-to-severe anxiety symptoms, with 35.4% in the moderate range and 26.5% in the severe category. A minority reported minimal anxiety (17.7%) or mild anxiety 20.4%).

The prevalence of severe depression was 31.9% (95%, CI: 23.7-41.1), and severe anxiety was 26.5% (95% CI: 18.7-35.5) overall, nearly seven in ten women in this study experienced clinical significant levels of depression, while over six in ten experienced clinically significant anxiety (Table 2, Figure 1).

Self-Reported Causes of Emotional Distress

Participants also identified several psychological stressors contributing to their emotional distress. The commonly cited source was fear of death (66.4%), followed by body image concerns (45.1%), financial burden (39.8%), and treatment uncertainty (35.4%). Other problems included loss of independence (29.2%) and family stigma or abandonment (18.6%). These results highlight the multifaceted nature of emotional distress among breast cancer patients in Zambia (Table 3, Figure 2).

These themes were extracted from structured responses and confirmed across participant responses using descriptive thematic categorisation.

Table 2: Prevalence and Severity of Depression and Anxiety Among Women with Breast Cancer (N = 113). Depression was assessed using the Beck Depression Inventory (BDI) and anxiety using the Beck Anxiety Inventory (BAI). Cut-off scores were applied as per the Beck manuals: BDI (0-9 = normal, 10-18 = mild to moderate, 19-29 moderate to severe, 30-63 =severe) and BAI (0-7 = minimal, 8-15 = mild, 16-25 = moderate, 26-63 = severe). Nearly 70% of participants reported moderate-to-severe depression, and more than 60% reported moderate-to-severe anxiety.

Scale	Category	Frequency (n)	Percent (%)	95% CI
Depression (BDI)	Normal (0-9)	16	14.2	8.6-22.5
	Mild to moderate (10-18)	19	16.8	10.9-25.0
	Moderate to severe (19-29)	42	37.2	28.7-46.5
	Severe (30-63)	36	31.9	23.6-41.2
Anxiety (BAI)	Minimal (0-7)	20	17.7	11.3-26.5
	Mild (8-15)	23	20.4	13.7-29.0
	Moderate (16-25)	40	35.4	27.0-44.8
	Severe (26-63)	30	36.5	18.7-35.7

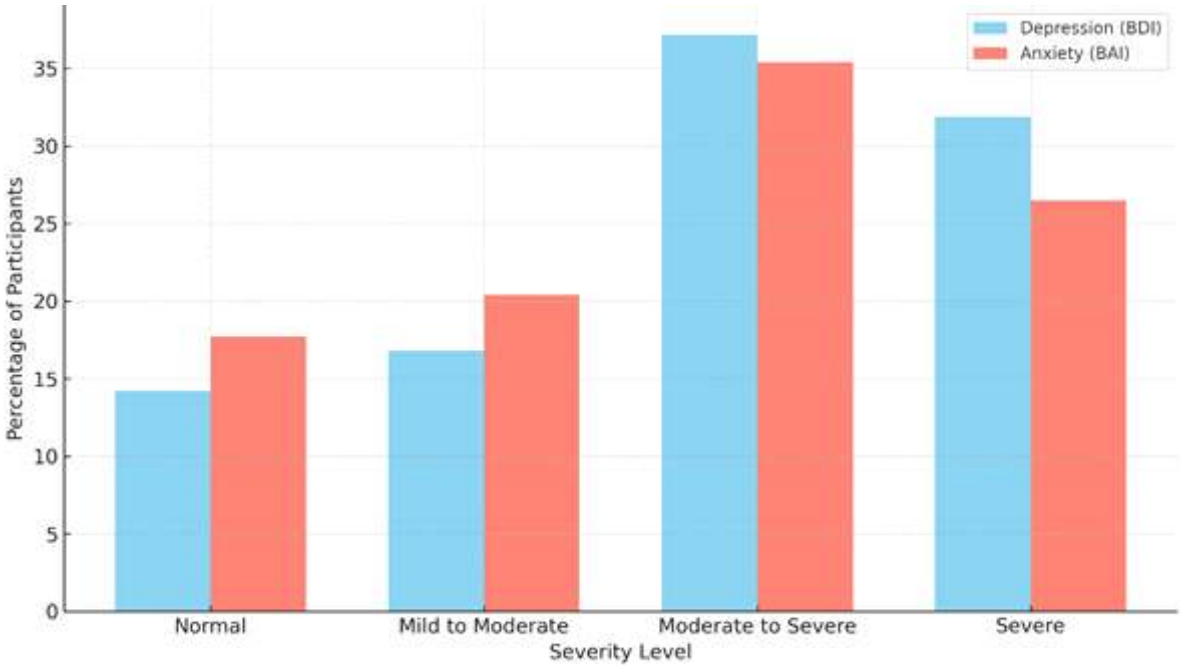

Figure 1: Prevalence of Depression and Anxiety Among Breast Cancer Patients (N = 113). This chart illustrates the percentage distribution of participants according to severity levels based on Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) scores. Cut-offs: *BDI (0-9 = normal, 10-18 = mild to moderate, 19-29 moderate to severe, 30-63 =severe) and BAI (0-7 = minimal, 8-15 = mild, 16-25 = moderate, 26-63 = severe).*

Table 3: Patient-Reported Sources of Emotional Distress Among Women with Breast Cancer (N = 113, Multiple responses allowed). This table summarises the most frequently cited sources of emotional distress. Fear of death, body image changes, and financial burden were the most reported concerns.

Sources of Distress	Frequency (n)	Percentage (%)
Fear of Death	75	66.4
Body image changes	51	45.1
Financial burden	45	39.8
Uncertainty about treatment	40	35.4
Loss of independence	33	29.2
Family stigma or abandonment	21	18.6

Note: Participants could identify more than one source of distress; therefore, percentages exceed 100%.

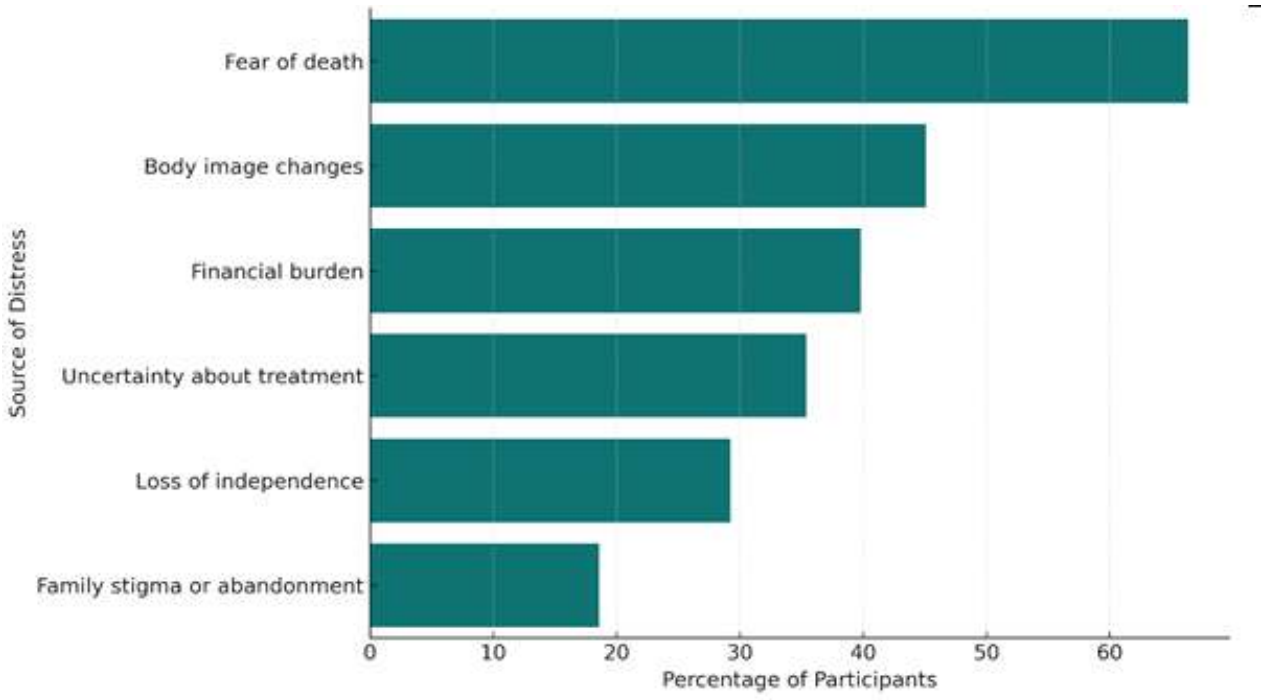

Figure 3: Patient-Reported Sources of Emotional Distress (N = 113, Multiple Responses Allowed). Participants identified multiple psychosocial and practical concerns as contributing to their mental distress, with fear of death, body image concerns, and financial constraints being the most prevalent.

DISCUSSION

This study demonstrated a high prevalence of psychological distress among women diagnosed with breast cancer at the Cancer Diseases Hospital in Lusaka; 69.1% of participants exhibited moderate-to-severe depression, and 61.9% reported moderate-to-severe anxiety. These findings underscore the significant mental health burden in oncology populations in low-resource settings and are consistent with studies from other low- and middle-income countries (LMICs), where limited psychosocial services contribute to elevated distress levels among cancer patients [11-12,21].

Interpretation through the Transactional Model of Stress and Coping

Lazarus and Folkman's Transactional Model of Stress and Coping provides a useful framework to interpret these results. According to the model, psychological distress arises when individuals appraise a stressor, such as a cancer diagnosis, as a significant threat (primary appraisal) and perceive their coping resources as inadequate (secondary appraisal) [13]. In our study, commonly reported stressors, including fear of death (66.4%), body image changes (45.1%), and financial burden (39.8%), reflect threatening primary appraisals. Meanwhile, the limited access to psychosocial support services and financial safety nets, and stigma surrounding mental health [4,5,14] represent restricted secondary appraisal resources, which intensify distress.

Sociodemographic and Clinical Correlates

Our findings revealed that younger women (25-40 years) reported higher levels of distress compared with older participants, despite being fewer in number. This aligns with evidence from Sharma and Purkayastha [16], who reported that younger breast cancer patients in India experienced profound disruptions in emotional and social functioning, particularly related to fertility and future roles.

Similarly, studies from Germany confirmed that younger women exhibited higher levels of anxiety and depression linked to body image concerns and social functioning [17,18].

Educational attainment and employment status were also associated with psychological outcomes. Participants with only primary or no formal education reported higher levels of depression and anxiety, a trend consistent with Bener et al. [19], who found that low education correlated with greater hopelessness and depression among breast cancer patients. Economic insecurity further compounded these challenges, echoing findings from Papaspyrou et al. [20] that financial strain is a critical driver of distress in patients, particularly in LMIC contexts.

Comparison with Other Regional Findings

Our prevalence estimates fall within the range reported in similar African settings. Paul et al. [11] reported an 80% prevalence of depression among cervical cancer patients at the same hospital in Zambia, while Osei-Bonsu et al. [8] found depression and anxiety symptoms in over half of Ghanaian cancer patients. A recent Ethiopian study also reported high rates of depression (61.7%) among breast cancer patients [21]. Together, these findings reinforce the importance of psychosocial interventions as a standard component of cancer care in African oncology services.

Public Health and Clinical Implications

From a systems perspective, these results emphasise the need for integration of psychosocial care into oncology services in Zambia. Tools such as the BDI and BAI are practical for routine screening in low-resource clinical environments and can facilitate early referral to counselling or psychiatric care. Furthermore, targeted interventions should address the dominant stressors identified in this study: fear of death, financial strain, and body image concerns through multidisciplinary approaches involving oncologists, mental health professionals, and social workers. Failure to address these psychosocial concerns may comprise adherence to treatment regimens and ultimately affect survival outcomes.

Strengths and Limitations

This study has several strengths. It is among the few studies in Zambia to quantify the psychological burden of breast cancer using validated psychometric tools (BDI and BAI), ensuring standardised measurement. The study was conducted at the national referral oncology centre, which enhances the representativeness of the findings for the Zambian cancer population. Additionally, exploring patient-reported sources of distress provided valuable contextual insight beyond symptom measurement.

However, limitations must be acknowledged. The cross-sectional design precludes causal inferences about relationships between sociodemographic or clinical factors and psychological outcomes. Distress sources were collected through structured survey responses rather than in-depth interviews, which limited the richness and qualitative understanding. Finally, the study focused only on women receiving care at a referral hospital in an urban setting, which may limit generalisability to rural patients or those with other cancer types.

Conclusion and Recommendations

This study found that most women diagnosed with breast cancer in Zambia experience moderate-to-severe levels of anxiety and depression. Psychosocial stressors, especially fear of death, body image changes, and financial burden, were central to this emotional burden. These findings highlight the urgent need for mental health integration into cancer care in Zambia.

Recommendations:

1. Incorporate routine screening for depression and anxiety in oncology care using tools such as BDI and BAI.
2. Institute psycho-oncology services with trained mental health professionals embedded in cancer care.
3. Train oncology staff in basic mental health first aid to support early identification and referral.

4. Develop multidisciplinary interventions addressing patient-reported concerns, especially fear of death, financial strain, and body image.
5. Conduct future longitudinal and qualitative studies to explore coping trajectories and patient narratives over the cancer care continuum.

What is Known About This Topic

- Breast cancer patients frequently experience levels of psychological distress.
- Depression and anxiety impact treatment adherence and overall cancer outcomes.
- In Low-income settings, psychosocial support within cancer care is often underdeveloped.

What This Study Adds

- Provides evidence that over 60% of breast cancer patients in Zambia experience moderate to severe psychological distress.
- Identifies key self-reported causes of emotional burden (fear of death, body image, financial hardship).
- Supports the feasibility of structured screening tools (BDI, Bai) in low-resource clinical settings.
- Underscores the need for context-sensitive mental health services in national oncology care systems.

Declarations

Ethics Approval and Consent to Participate

The study received ethical approval from the Mulungushi Research Ethics Committee. Written informed consent was obtained from all participants before data collection activities. Participant anonymity and confidentiality were strictly maintained throughout the study.

Consent for Publication

Not applicable. This manuscript does not contain any individual-level or identifying data requiring specific consent for publication.

Competing Interests

The authors declare that they have no competing interests.

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The study did not receive any external funding.

Authors Contributions

TMK conceptualised the study, collected and analysed data and drafted the initial manuscript. GP, JM, and NRS provided methodological guidance and manuscript feedback. All authors read and approved the final manuscript.

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