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## Observational Study

## Depression and anxiety among cancer patients visiting a tertiary care cancer hospital

Maheshor Kaphle, Diya Bajracharya, Nirmala Regmi, Dipsikha Aryal, Rajesh Karki

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Cancer patients frequently experience psychological problems related to reactions to cancer diagnosis, cancer type and stage, treatment effects, recurrence, fear of end-of-life, survivorship, and financial burden. Depression and anxiety are both psychological and physiological disturbances among cancer patients.

**AIM**

To assess the prevalence of depression and anxiety among cancer patients attending a tertiary care cancer hospital.

**METHODS**

A cross-sectional study was conducted at Bhaktapur Cancer Hospital in Kathmandu Valley among 220 cancer patients aged from 18 years to 70 years. Ethical approval was taken from the Institutional Review Committee of CiST College. Convenient sampling was used to interview patients with the standardized Patient-Health Questionnaire (PHQ-9) for Depression and Hospital Anxiety and Depression sub-scale (HADS-A) for anxiety. Epi-Data was used for data entry and transferred to SPSS Version 25 for analysis.

**RESULTS**

The study revealed that of 220 patients, most of the respondents belonged to the

age group 51-60 years. More than half 131 (59.6%) of the respondents were female, most of them had depression, and one-third had anxiety. Among the respondents, 124 (56.4%) had mild depression, 70 (31.8%) had moderate depression, and 3 (1.3%) had severe depression; 79 (35.9%) had mild anxiety, 64 (29.1%) had moderate anxiety, and 4 (1.8%) had severe anxiety.

### CONCLUSION

Most respondents were depressed and one-third had anxiety. More than half and nearly one-third had mild and moderate depression, respectively, and nearly one-third had mild and moderate anxiety, which is higher than other studies.

**Key Words:** Anxiety; Cancer patients; Depression; Nepal; Prevalence

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**Core Tip:** A cancer diagnosis sparks fear, and those with this condition commonly exhibit greater psychological and emotional stress levels than the general population. Most cancer patients may face psychological problems due to the unavailability of appropriate services in middle and low-income countries like Nepal. We conducted a cross-sectional study among 220 cancer patients to assess the prevalence of depression and anxiety through standard tools. This study found a high prevalence of depression and some anxiety among the patients and suggested that physicians organize counseling services and cancer therapy in hospitals.

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## INTRODUCTION

Cancer is a feared diagnosis, and cancer patients demonstrate a higher tendency for psychological and emotional stress compared to the general population[1]. Cancer patients are more likely to experience adverse mental health outcomes such as depression and anxiety, both psychological and physiological disturbances characterized by a set of physical, emotional, and behavioral elements[2,3]. Depression is a common mental disorder. Globally, it is estimated that 5% of adults suffer from the disorder. It is characterized by persistent sadness and a lack of interest or pleasure in previously rewarding or enjoyable activities[4]. Patients who are depressed have been shown to have worse treatment compliance rates. Patients with anxiety symptoms are more likely to be readmitted, whereas patients with mental distress and depressive symptoms have been linked to extended hospital stays. Additionally, survival seems to be impacted since cancer patients with mental health disorders have higher mortality rates[5]. The primary cancer site also affects the prevalence of depression, with pancreatic and lung cancers having the highest rates and invasive skin cancer having the lowest. Age also affects prevalence. While several cancers in adults were found to be inversely correlated with age and depression, data suggests that children and adolescents with cancer are less depressed than healthy controls. Another important consideration is sex. Researchers discovered that female cancer patients were two to three times as likely than male patients to experience depression[6]. Patients with cancer are more likely than the general population to have psychological discomfort at any point after diagnosis, including long after finishing treatment. Psychological discomfort is linked to reduced life satisfaction and a reduction in daily activities, as well as lower treatment compliance and efficacy, increased mortality, and a higher risk of suicidal thoughts. As a result, treating the symptoms of anxiety and sadness can help these people live better in the 1<sup>st</sup> year after being diagnosed with cancer. Anxiety and despair may also be exacerbated by the outward signs of some tumors[7].

Cancer is far more than a physical illness. The psychosocial impact of cancer and cancer treatment, because it is multifaceted and potentially long-lasting, often extends into the disease-free survival period. The nature and intensity of this impact varies widely, depending on tumor sites, disease staging, nature of the treatment, patient's life circumstances, personal resources, and resilience[8]. According to Literature, Germany had a lifetime prevalence of anxiety disorders of 30.5% (95%CI: 28.0-33.0) based on 2 studies and a pooled adjusted 4-wk prevalence of 13.5% (95%CI: 7.1-24.3) based on 10 studies[9,10]. It is estimated that cancer patients experience depression at a rate that is up to three times higher than that of the general population. While palliative care wards have reported depression rates as high as 49.0%, studies utilizing the Diagnostic and Statistical Manual of Mental Disorders criteria for major depressive disorder have found prevalence rates ranging from 2.0%-43.5%[1]. The prevalence of depression and anxiety was found to be higher in Nepal for breast cancer patients and may trigger other psychological morbidities[11]. High levels of signs and symptoms can persist for a long time in some patients, interfering with their daily activities and bringing on perceived threats such as disruption of family and life plans, a decline in quality of life, recurrence or progression of disease, and even death[12]. More attention has recently been given to the cancer population's rapidly rising prevalence of psychological issues. Cancer diagnosis and

treatment can be an extremely stressful situation during and after the therapy. Despite the increasing evidence that cancer patients are more likely to experience psychological distress, research has shown that in 40%–90% of cases, medical professionals fail to recognize cancer patients who are depressed and anxious, which results in inadequate treatment[13]. Depression in cancer patients should be identified since it may lower survival rates and indicate early death. When anxiety and depression are present, treatment for depression and cancer might become more difficult and treatment compliance issues can make matters worse. The aim of this study is to assess the prevalence of depression and anxiety among cancer patients attending Bhaktapur Cancer Hospital in Nepal.

## MATERIALS AND METHODS

### *Design and study duration*

A cross-sectional and descriptive study was conducted among cancer patients attending Bhaktapur Cancer Hospital, Nepal. The total study duration was from April to September 2022.

### *Data source and sampling method*

Cancer patients 18 years or older who gave consent to participate in the study and were undergoing chemotherapy treatment and follow-up during the study period were included in the study. However, patients who were critically ill at the time of the interview and those with a history of diagnosed mental disorders were excluded from the study. Convenient sampling methods were used for data collection. The Patient-Health Questionnaire (PHQ-9) was used to assess for depression and the Hospital Anxiety and Depression Sub-Scale (HADS-A) was used to assess for anxiety during interviews.

The sample size for this study was calculated using a single population proportion formula, with the proportion of cancer patients with depression (24%)[14], 95% confidence interval, 6% margin of error, and adding a 10% non-response rate by using the following formula:

$$n = Z^2 pq/e^2.$$

$$n = 1.96^2 \times 0.24 \times (1-0.24)/0.06^2 = 195.5.$$

Where  $n$  = sample size;  $Z = 1.96$  at 95% CI;  $P$  = prevalence of depression 24% taken from previous study[14].

The sample size needed for this study was 196 participants. By adding 10% non-response, the sample size was increased to 215 participants. A sample of 220 participants were used for the analysis.

### *Tools and techniques*

Data was collected from July 1, 2022 to July 15, 2022 by in-person interviews. Two standardized questionnaires were used for data collection. We used the Nepali version of the Patient Health Questionnaire (PHQ-9) for depression[15] and the Hospital Anxiety and Depression Scale (HADS-A) for anxiety[16].

The HADS-A consists of 14 items. Seven of the items indicate anxiety and those seven items were used to measure anxiety. PHQ-9 consists of nine ordinal scale questions ranging from '0' for 'Not at all' to '3' for 'Nearly every day'. Seven anxiety ordinal questions also consist of ordinal scale questions ranging from '0' for 'Not at all' and 3 for 'Most of the time'. Scores from both scales were summed separately. To assess depression, scores were categorized as no depression (0-4), mild depression (5-9), moderate depression (10-19), and severe depression ( $\geq 20$ )[17] on the PHQ-9. To assess anxiety, scores were categorized as no anxiety (0-7), mild anxiety (8-10), moderate anxiety (11-15), and severe anxiety (16-21) on the HADS-A scale[18,19].

### *Statistical analysis*

Data were entered into Epi-Data v.3.1 and exported to SPSS Version 25 for analysis. Variables were recoded and transformed before the final analysis. Descriptive statistics such as mean, standard deviation, frequency, and percentage were calculated to present the sociodemographic characteristics of study participants. The prevalence of anxiety and depression symptoms were calculated by summing the PHQ-9 and HADS-A scores and categorizing them.

### *Ethical approval*

Permission was obtained from the hospital and ethical clearance was obtained from the Institutional Review Committee of CiST College (Ref. No.152/077/078) before the study. Written consent was taken from the patients before interviewing them. The names of the participants were not used in any documents, instead, identification codes were used. Voluntarism and the freedom to withdraw from the study at any time were maintained.

## RESULTS

### *Sociodemographic characteristics and level of depression and anxiety*

Among 220 cancer patients attending Bhaktapur Hospital, 131 (59.5%) were female. The mean age of the patient was 50.38 ( $\pm 12.63$ ) years with a minimum of 18 and a maximum of 79 years. Most of the patients 161 (73.2%) were married and had more than secondary-level education 137 (62.3%; Table 1). Most of the patients were involved in business 72 (32.7%), followed by being a homemaker 62 (28.2%), and service industry 41 (18.6%). It is noteworthy that 77 (43.8%) of the

**Table 1 Sociodemographic characteristic and level of depression and anxiety, n (%)**

| Characteristic  | Attributes                | Not depressed | Depression | Total      | Not anxious | Anxious    |
|-----------------|---------------------------|---------------|------------|------------|-------------|------------|
| Age             | 18-59                     | 34 (20.2)     | 134 (79.8) | 168 (76.4) | 57 (33.9)   | 111 (66.1) |
|                 | 60-80                     | 10 (19.2)     | 42 (80.8)  | 52 (23.6)  | 16 (30.8)   | 36 (69.2)  |
| Sex             | Male                      | 17 (19.1)     | 72 (80.9)  | 89 (40.5)  | 35 (39.3)   | 54 (60.7)  |
|                 | Female                    | 27 (20.6)     | 104 (79.4) | 131 (59.5) | 38 (29.0)   | 93 (71.0)  |
| Marital status  | Married                   | 37 (23.0)     | 124 (77.0) | 161 (73.2) | 58 (36.0)   | 103 (64.0) |
|                 | Single                    | 7 (11.9)      | 52 (88.1)  | 59 (26.8)  | 15 (25.4)   | 44 (74.6)  |
| Education       | Up to secondary level     | 19 (22.9)     | 64 (77.1)  | 83 (37.7)  | 26 (31.3)   | 57 (68.7)  |
|                 | More than secondary level | 25 (18.2)     | 112 (81.8) | 137 (62.3) | 47 (34.3)   | 90 (65.7)  |
| Stage of cancer | First stage               | 2 (4.5)       | 14 (8.0)   | 16 (7.3)   | 7 (9.6)     | 9 (6.1)    |
|                 | Second stage              | 22 (50.0)     | 58 (33.0)  | 80 (36.4)  | 27 (37.0)   | 53 (36.1)  |
|                 | Third stage               | 17 (38.6)     | 77 (43.8)  | 94 (42.7)  | 30 (41.1)   | 64 (43.5)  |
|                 | Fourth stage              | 3 (6.8)       | 27 (15.3)  | 30 (13.6)  | 9 (12.3)    | 21 (14.3)  |

depressed patients were diagnosed with third-stage cancer, followed by 58 (33.0%) with second-stage cancer. Among those suffering from third-stage cancer, 64 (43.5%) patients were identified as anxious (Table 1).

Of the patients, 124 (56.4%) respondents were identified as mildly depressed, 70 (31.8%) as moderately depressed, and 3 (1.4%) as severely depressed. Meanwhile, 23 (10.5%) respondents were categorized as having no depression. Additionally, 73 (33.2%) respondents exhibited no anxiety, while 79 (35.9%) showed mild anxiety. Among the patients, 64 (29.1%) had moderate anxiety, and only 4 (1.8%) were found to have severe anxiety (Table 2).

Most of the patients have breast cancer 50 (22.7%) followed by lung cancer 25 (11.4%), stomach cancer 22 (10.0%), ovarian cancer 18 (8.2%), gall bladder cancer 15 (6.8%), and other different types of cancer as shown in Figure 1A.

Most of the respondents were treated for third-stage cancer 94 (42.7%), followed by second-stage cancer 80 (36.4%), and fourth-stage cancer 30 (13.6%) as presented in Figure 1B.

## DISCUSSION

The study findings revealed that 56.4% of the respondents were found to be mildly depressed, 31.8% were moderately depressed, and only 1.4% as severely depressed, while 10.5% of the respondents were found to be not depressed. These findings are similar to a study conducted in Germany where 49.8% were not depressed, 35.1% were mildly depressed, 11.3% were moderately depressed, and 3.7% developed severe depression[20].

Similarly, 33.2% of the respondents were found to be not anxious, 35.9% had mild anxiety, 29.1% had moderate anxiety, and only 1.8% had severe anxiety. This finding is similar to the study conducted in Iran where 54.0% of patients had no clinical symptoms of anxiety, 29.3% had mild anxiety, and 16.7% with moderate anxiety, respectively[21].

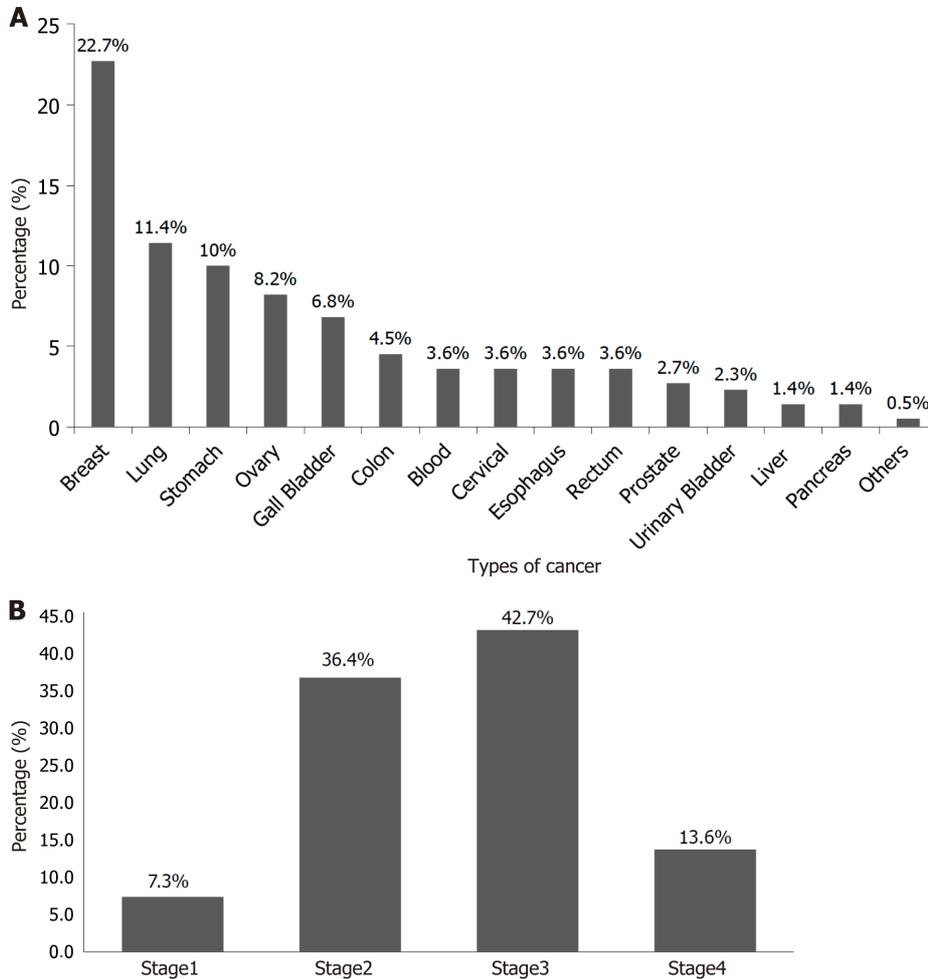
Anxiety and depression are common complications of cancer that are often neglected. Cancer is a feared diagnosis, and cancer patients demonstrate a higher tendency for psychological and emotional stress compared to the general population[22]. In a sample of 220 participants, 80.0% exceeded clinical cut-off scores on standardized depression. This finding is similar to a study conducted through the National Cancer Institute, where 46.7% of the study exceeded the clinical cut-off score on the PHQ-9 standardized measure[23]. In this study, the prevalence of depression was remarkably higher. In the sample of the study, the depression status of the patients was measured for a short time. In addition, most of the cancer patients were in their second and third stages (36.4% and 42.7%), which may be one of the reasons for the higher prevalence of depression. Advanced stages of cancer might lead to increased psychological distress due to factors like increased symptom burden, more aggressive treatments, or decreased prognosis.

The study findings also revealed that a higher proportion of anxiety was observed in females. Of the 220 respondents, 71.0% were female. This finding is similar to the study conducted by Imtiaz Ahmad Dogar (2009) in Pakistan which concluded that 70% of the female population met the criteria for major depression, anxiety disorder, or both[24]. Similarly, young women diagnosed with any type of advanced cancer are particularly vulnerable to distress disorders as they see their expected life roles and responsibilities changed, generally with respect to their family and work environment[25]. However, a higher proportion of depression was seen in males (80.9%) which is similar to a study conducted in India where a higher proportion of depression was observed in men compared to women[26].

The study findings also showed that anxiety and depression levels were found to be higher in the 45 years and older age group, which is similar to a study in Ethiopian patients with cancer. The finding of this study showed that older age groups were more prone to depression. Older patients experience longer disease duration, a higher risk of cancer metastases, and more disabilities, all of which contribute to depression[2]. Another reason could be that older patients have difficulty seeking assistance and communicating with others. Furthermore, worrying about excessive treatment

**Table 2** Distribution of respondents according to depression and anxiety level, *n* (%)

| Level      | Normal    | Mild       | Moderate  | Severe  |
|------------|-----------|------------|-----------|---------|
| Depression | 23 (10.5) | 124 (56.4) | 70 (31.8) | 3 (1.4) |
| Anxiety    | 73 (33.2) | 79 (35.9)  | 64 (29.1) | 4 (1.8) |



**Figure 1** Different cancer among patients. A: Type of cancer among patients; B: Stage of cancer in patients.

costs and family financial difficulties may be causes of psychological distress.

The study findings revealed that a higher proportion of depression and anxiety was observed in illiterate patients. This finding is supported by a study from Nepal where the education category was most affected. For illiterate respondents with lower levels of education, challenges increase as it becomes difficult for them to get enough information or understand the disease processes and its management, which results in cognitive and emotional difficulty in understanding complex information and decision-making[27]. Similar findings were seen in a study conducted by the *Department of Psychology* among Ethiopian cancer patients, where illiterate patients were more anxious and depressed than literate ones[28]. Likewise, the finding is similar to the study conducted by Khalil *et al*[26] in 2016 which showed that out of 143 (47.7%) uneducated patients, 85 (59.4%) were depressed and the educational category was most affected[29].

The interesting finding in this research is about marital status, where depression (88.1%) and anxiety (74.6%) were present in higher proportions compared to single patients. It was found that single patients faced more depression than married patients. This study's findings matched with previous research conducted by Lavdaniti *et al*[30] in 2012 which found that unmarried and divorced individuals showed higher levels of depression compared to married persons. A possible explanation for this is that divorced/single patients did not have moral support from their family members compared to married patients. Similar to another study, Pasquini and Biondi[31] mentioned in 2007 that social support also played an important role in alleviating depression among cancer patients, and family counselling should be implemented to educate the family members.

In this study, the prevalence of depression (80.4%) and anxiety (66.9%) was seen more in unemployed respondents. This finding is supported by previous studies where unemployed patients with cancer are more likely to be affected by depression. Hence, unemployment in combination with cancer exerts overwhelming physical and psychological strain,

such as depression and anxiety in an individual[2]. Employment was found to have a significant impact on depression in those suffering from cancer. Similarly, Rwandan patients showed a higher prevalence of anxiety (52.1%) and depression (67.1%)[22].

The prevalence of psychiatric disorders mostly varies at different stages of cancer. Despite the fact that adjustment disorders with depressed or anxious moods are more frequent at the early stage of the disease, severe psychiatric complications are more common in the late stages of cancer[32]. The study also shows that most of the patients had second or third-stage cancer (36.4% and 42.7%) in our study, which may be one of the reasons for the higher prevalence of depression, which is similar to a study conducted by Hong and Tian[33] which shows that 34.5% had third-stage cancer. The most common cancer found was breast cancer (22.7%). This is consistent with other studies finding breast cancer to be the most common cancer in Sudan[34]. The prevalence of depression and anxiety in breast cancer patients was found to be 54.5% and 46.8%, respectively[35].

### **Limitation**

Despite recent advancements in cancer treatment, Nepal is still struggling to improve and manage conventional modalities for cancer treatment because of many socioeconomic and political conditions. This scenario makes people believe cancer treatment is a dead-end which leads to higher levels of anxiety and depression among cancer patients. A major number of cancer patients die due to a lack of treatment facilities in Nepal. The limitation of the study was that the study was conducted in only one tertiary hospital.

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## **CONCLUSION**

The burden of depression and anxiety among cancer patients in this study was relatively higher. Since depression and anxiety disorders are common psychiatric disorders among oncology patients and can have a significant impact on the functioning of patients, it is important to screen them regularly and to provide necessary clinical interventions, treatment, and support. This is even more important in oncology patients in developing countries with limited resources. Priority should be given to screening and counseling cancer patients for anxiety and depression to help them cope with cancer as a disease and its impact on their mental health. The authors are encouraged to provide opportunities for potential avenues of future research within this field.

## **ARTICLE HIGHLIGHTS**

### **Research background**

Depression in cancer patients should be identified since it may lower survival rates and indicate early death. When anxiety and depression are present, treatment for depression and cancer might become more difficult and treatment compliance issues can make matters worse.

### **Research motivation**

Cancer patients are more likely to experience psychological distress, and medical professionals fail to recognize cancer patients who are depressed and anxious, which results in inadequate treatment.

### **Research objectives**

To assess the prevalence of depression and anxiety among cancer patients in a tertiary cancer center.

### **Research methods**

A cross-sectional study was conducted among 220 cancer patients by convenience sampling of patients attending a tertiary cancer hospital. We used a face-to-face interview technique to collect the data by using the standard tool Patient Health Questionnaire (PHQ-9) for depression and the Hospital Anxiety and Depression sub-scale for anxiety. Simple descriptive analysis was performed by categorizing the depression and anxiety according to the score.

### **Research results**

Most of the cancer patients had depression and one-third had anxiety. Among the respondents, 124 (56.4%) had mild depression, 70 (31.8%) had moderate depression, and 3 (1.3%) had severe depression; 79 (35.9%) had mild anxiety, 64 (29.1%) had moderate anxiety, and 4 (1.8%) had severe anxiety. It is noteworthy that 77 (43.8%) of the depressed patients were diagnosed with third-stage, followed by 58 (33.0%) with second-stage cancer, and 64 (43.5%) anxious patients with third-stage cancer.

### **Research conclusions**

Most of the cancer patients had depression and about one-third had anxiety which was high in third-stage cancer.

## Research perspectives

The prevalence of depression and anxiety was higher than in other studies. Our findings highlighted the necessity of counseling services parallel to cancer therapy.

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## FOOTNOTES

**Co-first authors:** Maheshor Kaphle and Diya Bajracharya.

**Author contributions:** Kaphle M and Bajracharya D (equal contributors) conceptualized the study and prepared the proposal, data collection, data analysis, and preliminary preparation of the manuscript; Regmi N was involved in data curation and review of the manuscript; Aryal D was involved in writing and editing the manuscript; Karki R was involved in investigating, editing, and critically reviewing the manuscript; Kaphle M had the final authority to submit for publication; all authors have read and agreed to the published final version of the manuscript. Kaphle M and Bajracharya D have been designated co-first authors in recognition of their distinct yet complementary contributions throughout the research. Kaphle M excelled in data management, analysis, and bringing expertise in the critical review of the manuscript, while Bajracharya D played a key role in data collection, entry, preliminary analysis and contributed significantly to manuscript writing. Both authors demonstrated equal dedication and effort from project inception to completion, particularly during concept development, design, and critical writing and response to the reviewer. The collaborative nature of the research team was essential, with each member contributing unique skills and acknowledging it. It's important to note that while Kaphle M and Bajracharya D are co-first authors, appreciation extends to the entire team for their valuable contributions. The decision for co-first authorship reflects a transparent and inclusive process, honoring the collaborative spirit that propelled the success of the research.

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**Informed consent statement:** Written consent was taken from the patients before interviewing them. The names of the participants were not used in any documents, instead, identification codes were used. Voluntarism and the freedom to withdraw from the study at any time were maintained.

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