

Assessment of psychological distress and its associated factors among patients with cancer undergoing chemotherapy in rural Bangladesh

Md Marufur Roshid¹, Md Moshir Rahman¹, Mohammad H. R. Sarker²,
Md Jiaur Rahman¹, Junaidi B. Prihanto³, Md Nazmul Alam⁴, Kaniz F. Eity⁴,
Mehedee H. Masud⁴, Masayuki Kakehashi¹, Hitoshi Okamura¹

¹Graduate School of Biomedical and Health Sciences, Hiroshima University, Hiroshima, Japan, ²International Centre for Diarrhoeal Disease Research, Bangladesh (icddr, b), Dhaka, Bangladesh, ³Health Education, Health and Recreation, Sport Science Faculty, Universitas Negeri Surabaya, Indonesia, ⁴Oncology Department, Khwaja Yunus Ali Medical College and Hospital, Sirajgonj, Bangladesh

ABSTRACT

Background: Psychological distress may worsen during cancer treatment and affect well-being. Information on the prevalence of distress and its associated variables in cancer patients undergoing chemotherapy in rural Bangladesh has not been thoroughly explored. To address this, we aimed to assess psychological distress and its associated factors in patients with cancer undergoing chemotherapy. **Methods:** This cross-sectional study was conducted at a tertiary care hospital in rural Bangladesh. Only adult patients with cancer who were receiving chemotherapy were enrolled in this study. The validated Depression Anxiety Stress Scale was used to assess psychological distress. Frequency and percentages were used in descriptive analysis, and logistic regression analysis was performed to investigate potential associated factors for depression, anxiety, and stress. **Results:** Participants comprised 415 patients with a mean age of 46.3 years. The prevalence of depression, anxiety, and stress was 61.5%, 55.4%, and 22.0%, respectively. In the multivariate logistic regression analysis, patients with more than five family members and smokeless tobacco users had a significant association with depression, anxiety, and stress. In contrast, participants aged >60 years had a protective association with depression. **Conclusions:** Our findings show that patients with cancer receiving chemotherapy experience a high prevalence of depression and anxiety and that the use of smokeless tobacco and having six or more family members are associated with psychological distress. These findings will aid health professionals and policymakers in establishing and implementing improved care programs to ensure the greater mental health of cancer survivors, particularly in resource-limited settings.

Keywords: Bangladesh, cancer, chemotherapy, DASS-21, psychological distress

Introduction

Cancer is responsible for a clinical, social, and economic burden equivalent to all other human diseases combined in terms of cause-specific disability-adjusted life years.^[1] Approximately 19.3 million new cases were diagnosed worldwide in 2020, alongside approximately 10.0 million cancer deaths, making it the second

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Address for correspondence: Dr. Hitoshi Okamura,
1-2-3, Kasumi, Minami-Ku, Hiroshima 734-8553, Japan.
E-mail: hokamura@hiroshima-u.ac.jp

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leading cause of death globally. In Asia, the incidence rate of cancer accounts for 49.3% of cancer incidence globally, while the mortality rate is also significantly higher than in other regions of the world at 58.3%.^[2] The death rate in Asia and Africa exceeds the incidence rate owing to the varied distribution of cancer types and greater case fatality.^[2] According to global estimates, cancer will be detected in 14.1 million individuals annually between 2023 and 2030,^[3] and the number of cancer patients in low- and middle-income countries is expected to increase fivefold within the next four decades.^[4]

Cancer is a life-threatening condition associated with hopelessness, distressing pain, and the overwhelming fear of death, all of which affect numerous aspects of an individual's life. Chemotherapy, surgery, and radiotherapy are the most effective treatments currently available. During the course of treatment, patients with cancer often experience psychological distress, which creates a high level of mental pressure and can act as a silent killer.^[5] Fear of mortality, changes in quality of life, social connections, physical condition, and the capacity to create mental alterations are all linked to cancer. Psychological distress is very common among patients with cancer and is associated with a lower rate of survival. This distress can occur at any moment during a patient's illness period and can increase over time.^[6] Chemotherapy, which is most commonly used after radiation or surgery to treat patients with advanced cancer, causes several harmful effects. These include pain, weakness, alopecia, loss of appetite, weight loss, lack of sleep, diarrhea, vomiting, dry mouth, and neuropathy, which are the major causes of increased psychological distress.^[7,8]

Anxiety and depression in patients with cancer can be induced by a wide range of factors, including psychological reaction to the cancer diagnosis, a long course of therapy, treatment side effects, multiple hospitalizations, life disturbance, and poor quality of life.^[9] Other demographic factors, such as ethnicity and cancer type, may also affect the severity of psychological distress.^[10] Depression leads to decreased patient satisfaction with medical treatment, accelerates disease development, and increases the risk of suicide in all patients with cancer.^[11] Numerous international studies have reported clinically significant levels of distress among patients with cancer. For example, a study in the Southeast Asian region found a high prevalence of anxiety and depression among such patients, with the highest recorded rates being 88% and 65.5%, respectively.^[5] According to recent Australian research, the majority of patients (91%) experience clinically significant distress, with more than half (56%) experiencing severe psychological distress.^[12] A similar study in Germany found that psychological distress affected more than half of all patients with cancer who were screened.^[13] A study in the United States reported a 35.1% prevalence rate of significant distress, with patients diagnosed with lung cancer suffering the most (43.4%), followed by those with brain, Hodgkin's disease, pancreas, lymphoma, liver, head and neck, breast, leukemia, melanoma, colon, prostate, and gynecological cancers (29.6%).^[14]

Bangladesh has a population of 168 million, making it a densely populated country. While no specific trustworthy cancer statistics are available for Bangladesh, according to the statistics available, there are between 1.3 and 1.5 million patients with cancer, with roughly 0.2 million new cases reported each year.^[15] More than 66% of cancers occur in the 30–65 age group, whereas childhood malignancies represent only 1% of all cancer cases.^[16] However, few studies on mental health and its associated issues have been conducted in Bangladesh.^[17] Psychological distress is a common adverse effect of chemotherapy in patients with cancer; however, it has received relatively little attention in Bangladesh. Information on the prevalence of psychological distress and its associated variables also remains scarce, particularly for patients with cancer receiving chemotherapy in rural tertiary hospitals. Psychological distress experienced by patients with cancer can be reduced by integrating primary care into a comprehensive approach. Addressing the psychological needs of such patients is vitally important for primary care providers. Identifying the prevalence of psychological distress and factors linked to poor psychosocial outcomes in cancer patients undergoing chemotherapy in primary care settings is essential to determine who may require additional psychological assistance.

Participants and Methods

Design

A cross-sectional study was conducted between March 1 and May 15, 2022, at Khwaja Yunus Ali Medical College and Hospital. This tertiary care hospital is well-equipped and is located in Enayetpur, Sirajgonj, a rural part of Bangladesh. The hospital offers a wide range of services, with the oncology department specializing in cancer management.

Study population

Patients with cancer are admitted to the hospital for chemotherapy and only stay for a brief time. Participants were selected for this study using a convenient sampling technique and based on the following eligibility criteria: being 18 years or older, of either sex, being patients with cancer receiving chemotherapy at the Khwaja Yunus Ali Medical College and Hospital, and consenting to participate in this study. The exclusion criterion included mental illness (if they had prescriptions).

Sample size calculation

The sample size was calculated using the following formula:

$$n = (z)^2 p (1-p) / d^2,$$

where n = sample size, z = level of confidence according to the standard normal distribution, d = tolerated margin of error, and p = estimated proportion of the population.

The sample size was calculated using a 95% confidence interval (CI) for $z = 1.96$ and $d = 0.05$, and a sample proportion according to a similar study of 56.6% ($P = 0.57$).^[18] Based on this

equation, our sample size was 377. Accounting for a potential 10% dropout rate, the final sample size was 415.

Data collection

The trained study team received written informed consent before interviewing participants. Data were collected using a two-part questionnaire as well as face-to-face interviews and medical records. The first part of the questionnaire collected information on sociodemographic characteristics, including age, gender, education, marital status, number of family members, occupation, monthly family income, monthly family expenses, and monthly expenses for treatment purposes using a field-tested standardized questionnaire format.^[19] Information on behavioral characteristics, including a history of smoking, smokeless tobacco usage, and a family history of cancer was also collected. Information on patients' duration of cancer, cancer type(s), stages of cancer, and chemotherapy cycles was collected from medical records. The second part of the patient questionnaire employed the Depression Anxiety Stress Scale (DASS-21), which was validated and adopted for our context.^[20]

Measures

The DASS-21 was used to assess psychological distress.^[21] This scale consists of 21 questions, which are divided into three subscales, each of which has seven items. All items use a four-point Likert scale: 0 ("never applied to me at all"), 1 ("applied to me sometimes"), 2 ("applied to me for a considerable amount of time"), and 3 ("applied to me most of the time/always"). Total scores were obtained by adding the scores of seven items from each scale and multiplying them by two. Predefined DASS subscale ratings were used to assess mild, moderate, severe, and extremely severe conditions as follows: depression (normal 0–9, mild 10–13, moderate 14–20, severe 21–27, extremely severe ≥ 28), anxiety (normal 0–7, mild 8–9, moderate 10–14, severe 15–19, extremely severe ≥ 20), and stress (normal 0–14, mild 15–18, moderate 19–25, severe 26–33, extremely severe ≥ 34). Finally, we distinguished between responses in terms of "no" = normal (concerning depression, anxiety, or stress) and "yes" = mild to extremely severe (concerning depression, anxiety, or stress). The reliability test was excellent; the overall Cronbach's alpha was 0.94 for the DASS-21 scale, while Cronbach's alpha was 0.85 for depression, 0.85 for anxiety, and 0.86 for stress.

Data analysis

Data were analyzed using the Statistical Package for Social Sciences, IBM Statistics version 25. The descriptive analyses of the categorical variables were expressed as frequency and percentages. The outcome variables were depression, anxiety, and stress, and the independent variables were age, sex, education, marital status, number of family members, occupation, monthly family income, monthly family expenses, and monthly expenses for treatment. Logistic regression analysis was performed to investigate potential influencing factors of depression, anxiety, and stress. Odds ratios (ORs) were calculated to assess the association between DASS scores, sociodemographic variables,

and cancer-related factors. The association between variables was deemed statistically significant if the *P* value was < 0.05 .

Ethical considerations

The study was approved by the Ethical Review Committee of the Department of Public Health, Northern University Bangladesh (NUB) in 25 February 2022 (Memo No: NUB/DPH/EC/2022/11) and was carried out in accordance with the Helsinki Declaration.^[22] Written consent was obtained from all participants before participation, which ensured voluntary and anonymous participation. Prior to enrollment, all participants were informed of the study's objectives, its importance, risks, benefits, and patient safety.

Results

Participants

Table 1 presents the sociodemographic characteristics, health status, and psychological distress levels. The mean age of the participants was 46.3 (SD \pm 13.3) years. Most were male (65.5%), married (80.7%), and had literacy levels up to Higher School Certificate (HSC) (69.1%). The participants' occupations comprised employees (government and non-government) (25.8%) and self-employed (25.0%), and 60.7% of participants had ≤ 5 family members. A majority earned a monthly salary of more than 20,000 Bangladesh Taka. Smokers (cigarette or electronic cigarette) and smokeless tobacco users accounted for 53.0% and 47.5%, respectively. Moreover, 19.3% of participants had a family history of cancer. Among all participants, the most prevalent cancer was lung cancer (27.2%), 42.2% had received 3–4 chemotherapy cycles, and 40.7% had stage four cancer.

The incidences of depression, anxiety, and stress were 61.5%, 55.4%, and 22.0%, respectively.

Factors associated with depression

In multivariate logistic regression analysis, smokeless tobacco users [adjusted OR, 2.779, 95% CI (1.674–4.613); *P* value < 0.001], having more than five family members [2.232 (1.344–3.707); 0.002], lung cancer [3.563 (1.322–9.599); 0.012], prostate cancer [11.256 (1.689–75.029); 0.012], and receiving three to four chemotherapy cycles [1.865 (1.007–3.455); 0.047] had a significant association with depression. In contrast, being aged > 60 years (0.219 [0.085–0.569]; 0.002) had a protective association with depression. No significant associations were found with the other independent variables [Table 2].

Factors associated with anxiety

For anxiety, a significant association was observed for having more than five family members [adjusted OR, 3.111; 95% CI, (1.905–5.081); *P* value, < 0.001], smokeless tobacco users [2.606 (1.607–4.227); < 0.001], lung cancer [6.642 (2.513–17.557); < 0.001], prostate cancer [211.932 (2.257–63.070); 0.004], and other types of cancer [2.368 (1.009–5.555); 0.048].

Table 1: Participants' characteristics in terms of sociodemographic, health status, and psychological distress level (n=415)

Variables	Frequency (n)	Percentage
Age		
18–30	79	19.0
31–60	258	62.2
>60	78	18.8
Mean	48.9 years	
Gender		
Male	272	65.5
Female	143	34.5
Literacy		
Illiterate	48	11.6
Up to HSC	287	69.1
Higher	80	19.3
Family Members		
Up to 5	252	60.7
More than 5	163	39.3
Occupation		
Employee	107	25.8
Self-employee	104	25.0
Others	204	49.2
Marital Status		
Single	50	12.0
Married	335	80.7
Divorced	30	7.3
Income†		
Up to 20,000 BDT	62	15.0
More than 20,000 BDT	353	85.0
Smoking		
No	195	47.0
Yes	220	53.0
Smokeless tobacco users		
No	218	52.5
Yes	197	47.5
Family history of cancer		
No	335	80.7
Yes	80	19.3
Type of cancer		
Breast	44	10.6
Lung	113	27.2
Cervical	17	4.1
Prostate	14	3.4
Head-neck regions	48	11.6
GIT	63	15.2
Others genital tract	32	7.7
Others	84	20.2
Stage of cancer		
Stage I	17	4.1
Stage II	87	21.0
Stage III	142	34.2
Stage IV	169	40.7
Number of chemotherapy cycles		
1–2 cycles	96	23.1
3–4 cycles	175	42.2
5+ cycles	144	34.7

Contd...

Table 1: Contd...

Variables	Frequency (n)	Percentage
DASS-21		
Depression		
No	160	38.5
Yes	255	61.5
Anxiety		
No	185	44.6
Yes	230	55.4
Stress		
No	324	78.0
Yes	91	22.0

†As of 3 September 2022, 1 BDT=0.009 USD

None of the variables demonstrated a protective association with anxiety [Table 3].

Factors associated with stress

For stress, a significant association was observed for having more than five family members [adjusted OR, 2.857; 95% CI, (1.620–5.040); *P* value, <0.001], smokeless tobacco users [2.269 (1.015–5.072); 0.046], married [4.240 (1.378–13.046); 0.012], and receiving three to four chemotherapy cycles [2.269 (1.015–5.072); 0.046]. None of the variables showed a protective association with stress. No significant associations were found with the other independent variables [Table 4].

Discussion

This study revealed higher rates of depression [61.5% vs. 57%], anxiety [55.4% vs. 19%], and lower stress [22.0% vs. 24.5%] compared to the results of a prevalence study of patients with cancer at a cancer research hospital in Dhaka, Bangladesh.^[18] The cost of cancer therapy is four times higher than the treatment costs of other common health problems; however, the majority of individuals residing in rural areas and receiving care from regional hospitals are mainly poor and illiterate. These factors may be major contributors to the high prevalence of depression and anxiety in these contexts. Lower rates of depression and anxiety have been observed in a developed country, namely Australia (depression 15%, anxiety 19%, and stress 10%), while higher rates have been observed in neighboring developing countries, such as Nepal (depression 49.2% and anxiety 26.5%) and Pakistan (depression 38.2% and anxiety 32.2%).^[7,23,24] Notably, a study in India showed a higher rate of depression (90%) compared to our study, although the rates of anxiety and stress were similar.^[25] Differences in sample sizes, instruments, and cutoffs used to diagnose depression and anxiety, and the type of cancer studied, could all be contributing factors to these varying rates.

Notably, having more than five family members was associated with depression, anxiety, and stress, and a previous study in Bangladesh also found a link between having more than five family members and a high DASS-21 score.^[20] It has been widely documented that family members of patients with cancer are

Table 2: Associated variables with depression (DASS-21): Multivariate logistic regression

Variables	Categories	B	AOR (95% CI)	P
Age	18–30 years	ref.	ref.	ref.
	31–60 years	-0.496	0.609 (0.294–1.261)	0.182
	>60 years	-1.517	0.219 (0.085–0.569)	0.002**
Gender	Male	ref.	ref.	ref.
	Female	0.345	1.413 (0.639–3.122)	0.393
Literacy	Illiterate	ref.	ref.	ref.
	Up to HSC	0.278	1.320 (0.592–2.945)	0.497
	Higher	0.568	1.764 (0.652–4.772)	0.263
Family members	Up to 5	ref.	ref.	ref.
	>5	0.803	2.232 (1.344–3.707)	0.002**
Occupation	Employee	ref.	ref.	ref.
	Self-employee	0.121	1.129 (0.586–2.175)	0.718
	Others	0.331	1.393 (0.721–2.690)	0.324
Marital status	Single	ref.	ref.	ref.
	Married	0.221	1.247 (0.502–3.100)	0.635
	Divorced	0.070	1.072 (0.425–2.703)	0.883
Income	Up to 20,000 BDT	ref.	ref.	ref.
	More than 20,000 BDT	0.310	1.363 (0.694–2.677)	0.368
Smoking	No	ref.	ref.	ref.
	Yes	-0.659	0.517 (0.263–1.019)	0.057
Smokeless tobacco users	No	ref.	ref.	ref.
	Yes	1.022	2.779 (1.674–4.613)	<0.001**
Family history of cancer	No	ref.	ref.	ref.
	Yes	0.372	1.451 (0.813–2.590)	0.208
Cancer types	Breast	ref.	ref.	ref.
	Lung	1.271	3.563 (1.322–9.599)	0.012**
	Cervical	0.377	1.458 (0.405–5.255)	0.564
	Prostate	2.421	11.256 (1.689–75.029)	0.012**
	Others	0.585	1.795 (0.745–4.320)	0.192
Cancer stages	Stage I	ref.	ref.	ref.
	Stage II	-0.541	0.582 (0.141–2.397)	0.454
	Stage III	-0.682	0.505 (0.124–2.066)	0.342
	Stage IV	-1.169	0.311 (0.074–1.310)	0.111
Chemo cycles	1–2 cycles	ref.	ref.	ref.
	3–4 cycles	0.623	1.865 (1.007–3.455)	0.047**
	5+cycles	0.195	1.215 (0.630–2.344)	0.560

Nagelkerke $R^2=0.251$. DASS-21, Depression Anxiety Stress Scale; AOR, adjusted odds ratio. ** $P<0.05$

more susceptible to depression, most likely due to adverse changes in the sociodemographic situation, which ultimately causes the patients to become more prone to mental disease. A variety of supports is necessary to enhance the psychological health and well-being of this population.

While a number of studies have documented a strong link between smoking and psychological distress,^[26] this analysis found no evidence of an association with mental disorders. Instead, we found that smokeless tobacco use was a risk factor for psychological distress such as depression, anxiety, and stress. While only limited research has been conducted on this issue, some studies have reported similar findings. A study conducted in the United States found that long-term use of smokeless tobacco was associated with mental illness.^[27] Another study conducted in Saudi Arabia revealed that consumers of smokeless tobacco were more prone to experience depression.^[28] Two other studies identified an increased risk of depression in females who engaged

in the use of smokeless tobacco.^[29,30] There are more people using smokeless tobacco (27%) than smokers (23%) in Bangladesh.^[31] Given that the use of smokeless tobacco is currently regarded as culturally acceptable, greater public health awareness is required to combat smokeless tobacco, which might require government action such as implementing suitable targeted legislation.

Another finding of this study was that depression and anxiety were considerably more prevalent in patients with lung and prostate cancer than in those with breast cancer. In Bangladesh, as in other countries, men are at high risk of developing lung cancer. Recent studies have found a strong link between depression and anxiety in individuals with lung and prostate cancers, which further supports our findings.^[32,33] More research is needed to ensure that people with lung and prostate cancers are appropriately assessed and treated for psychological distress.

Table 3: Associated variables with anxiety (DASS-21): Multivariate logistic regression

Variables	Categories	B	AOR (95% CI)	P
Age	18–30 years	ref.	ref.	ref.
	31–60 years	-0.070	0.933 (0.475–1.829)	0.839
	>60 years	-0.615	0.540 (0.219–1.336)	0.182
Gender	Male	ref.	ref.	ref.
	Female	0.172	1.188 (0.559–2.524)	0.654
Literacy	Illiterate	ref.	ref.	ref.
	Up to HSC	0.004	1.004 (0.461–2.187)	0.992
	Higher	0.502	1.652 (0.622–4.390)	0.314
Family members	Up to 5	ref.	ref.	ref.
	>5	1.135	3.111 (1.905–5.081)	<0.001**
Occupation	Employee	ref.	ref.	ref.
	Self-employee	-0.420	0.657 (0.343–1.259)	0.206
	Others	-0.065	0.937 (0.486–1.808)	0.847
Marital status	Single	ref.	ref.	ref.
	Married	0.289	1.335 (0.564–3.158)	0.511
	Divorced	0.258	1.294 (0.513–3.262)	0.585
Income	Up to 20,000 BDT	ref.	ref.	ref.
	>20,000 BDT	0.565	1.759 (0.924–3.349)	0.086
Smoking	No	ref.	ref.	ref.
	Yes	-0.318	0.728 (0.379–1.396)	0.339
Smokeless tobacco users	No	ref.	ref.	ref.
	Yes	0.958	2.606 (1.607–4.227)	<0.001**
Family history of cancer	No	ref.	ref.	ref.
	Yes	-0.014	0.986 (0.564–1.725)	0.961
Cancer types	Breast	ref.	ref.	ref.
	Lung	1.893	6.642 (2.513–17.557)	<0.001**
	Cervical	1.207	3.343 (0.920–12.153)	0.067
	Prostate	2.479	11.932 (2.257–63.070)	0.004**
	Others	0.862	2.368 (1.009–5.555)	0.048**
Cancer stages	Stage I	ref.	ref.	ref.
	Stage II	0.136	1.146 (0.345–3.800)	0.824
	Stage III	0.439	1.552 (0.472–5.101)	0.469
	Stage IV	0.192	1.211 (0.357–4.116)	0.759
Chemo cycles	1–2 cycles	ref.	ref.	ref.
	3–4 cycles	0.133	1.143 (0.632–2.065)	0.659
	5+ cycles	-0.184	0.832 (0.438–1.581)	0.574

Nagelkerke $R^2=0.234$. DASS-21, Depression Anxiety Stress Scale; AOR, adjusted odds ratio. ** $P<0.05$

Our study also found that the third and fourth cycles of chemotherapy generated significantly higher rates of depression and stress than previous cycles. In India, a definite link has been reported between an increasing number of chemotherapy cycles and mental illnesses, such as depression and anxiety.^[25] In contrast, participants who had more than five chemotherapy cycles showed no significant relationship between depression and stress. One possible explanation is that such participants felt better after four cycles of chemotherapy or that they believed it would cure them. However, this finding requires further investigation.

One of the study's most intriguing findings was that patients aged >60 years had a protective relationship with depression. Several studies have found that younger age was associated with a higher risk of psychological distress, particularly depression.^[34–37] Specifically, in clinical environments, older patients with chronic illnesses were reported to experience

less psychological distress compared to their younger counterparts.^[36] Additionally, rates of depression were found to be more common among younger patients with cancer than older patients.^[37] However, we do not have an explanation for our findings. For this older demographic, further research is needed to corroborate or reject this finding. We found a statistically significant relationship with stress among patients who were married compared to other patients, which is comparable to the findings of research conducted in Nepal.^[23] It is quite plausible that having a life-threatening disease might interfere with patients' commitments to their families, and that they might take less care of themselves, which would lead to increased stress. A study in Turkey found that married patients with cancer lacked trust in stress reduction measures and had low self-care efficacy.^[38]

This paper discussed the prevalence of psychological distress and its associated factors in rural settings, providing valuable

Table 4: Associated variables with stress (DASS-21): Multivariate logistic regression

Variables	Categories	B	AOR (95% CI)	P
Age	18–30 years	ref.	ref.	ref.
	31–60 years	0.115	1.122 (0.471–2.672)	0.796
	>60 years	-0.053	0.948 (0.301–2.987)	0.927
Gender	Male	ref.	ref.	ref.
	Female	0.838	2.313 (0.848–6.309)	0.102
Literacy	Illiterate	ref.	ref.	ref.
	Up to HSC	0.144	1.155 (0.432–3.086)	0.774
	Higher	0.231	1.260 (0.374–4.242)	0.709
Family members	Up to 5	ref.	ref.	ref.
	>5	1.050	2.857 (1.620–5.040)	<0.001**
Occupation	Employee	ref.	ref.	ref.
	Self-employee	-0.580	0.560 (0.255–1.228)	0.148
	Others	-0.479	0.619 (0.280–1.368)	0.236
Marital status	Single	ref.	ref.	ref.
	Married	1.444	4.240 (1.378–13.046)	0.012**
	Divorced	-0.834	0.434 (0.122–1.551)	0.199
Income	Up to 20,000 BDT	ref.	ref.	ref.
	>20,000 BDT	0.867	2.379 (0.952–5.945)	0.064
Smoking	No	ref.	ref.	ref.
	Yes	0.388	1.474 (0.589–3.692)	0.407
Smokeless tobacco users	No	ref.	ref.	ref.
	Yes	0.961	2.613 (1.418–4.816)	0.002**
Family history of cancer	No	ref.	ref.	ref.
	Yes	-0.435	0.647 (0.305–1.373)	0.257
Cancer types	Breast	ref.	ref.	ref.
	Lung	-0.057	0.945 (0.320–2.792)	0.918
	Cervical	0.498	1.645 (0.392–6.908)	0.497
	Prostate	-20.321	0.000 (0.000–0.000)	0.998
	Others	-0.493	0.611 (0.226–1.655)	0.332
Cancer stages	Stage I	ref.	ref.	ref.
	Stage II	-0.981	0.375 (0.076–1.856)	0.229
	Stage III	0.504	1.655 (0.372–7.370)	0.509
	Stage IV	0.424	1.528 (0.332–7.033)	0.586
Chemo cycles	1-2 cycles	ref.	ref.	ref.
	3-4 cycles	0.819	2.269 (1.015–5.072)	0.046**
	5+ cycles	-0.019	0.981 (0.406–2.372)	0.967

Nagelkerke $R^2=0.262$. DASS-21, Depression Anxiety Stress Scale; AOR, adjusted odds ratio. ** $P<0.05$

insights for frontline family physicians who are actively involved in providing primary care. Early identification and timely treatment of psychological distress are likely to help alleviate the burden of such distress among patients with cancer.

The limitations of this study were time and budget constraints, due to which we selected only one hospital. Thus, the findings cannot be generalized to all patients with cancer. The patients' basic information was not completely recorded in the hospital; therefore, we used convenience sampling techniques, which may involve sampling bias. The sample itself was also not representative of the overall population. We did not find any notable association between gender and symptoms of depression, anxiety, and stress, possibly due to the small number of female participants. Finally, this was a cross-sectional study; therefore, it was not possible to determine causal relationships.

Conclusion

Our findings indicate that patients with cancer in our sample population who were undergoing chemotherapy had a high incidence of depression and anxiety. Having more than five family members, being a smokeless tobacco user, and having lung and prostate cancer types all played a significant role in relation to this high incidence. The findings of this study provide support for primary care providers and policymakers in working to reduce psychological distress in patients with cancer, as well as for the need to establish and implement appropriately targeted programs, including essential preventive measures.

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Key points

- Patients with cancer in Bangladesh's rural areas showed high rates of depression (61.5%) and anxiety (55.4%).
- Being in a family of more than five members was significantly associated with higher levels of depression, anxiety, and stress, with a prevalence of 39.3%.
- Smokeless tobacco use was identified as a risk factor for depression, anxiety, and stress, with approximately half (47.5%) of the participants reporting its use.
- This study provides valuable insights for developing and implementing enhanced care programs.

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Conflicts of interest

There are no conflicts of interest.

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