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A cross-sectional analysis on the patterns and prevalence of anxiety, stress, and depression in patients at diagnosis with cancers of the oral cavity: A single institutional study

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ABSTRACT

Background: It is a truth universally acknowledged that the diagnosis of cancer is a huge stress for both individuals and families. While many psychosocial variables have been shown to influence the mental well-being, these factors are so complicated and interlinked with each other, that their integrated effect on oral cancer patients, who constitute a large morbid group of patients, is yet to be recognized. **Aims and Objectives:** The present research work aims to find more about the prevalence of stress, anxiety, and depression among patients with cancers of the oral cavity and work out on some key potentially predictive factors associated with anxiety and depressive symptoms. **Materials and Methods:** A cross-sectional observational study was carried out for patients of oral cancer, attending the radiation oncology out-patient department (OPD) at Medical college, Kolkata, between April 2022 and March 2023, a 1-year period. A total of 89 patients with oral cancer were interviewed with questionnaires on demographic variables, depression anxiety stress scale 21, and National Comprehensive Cancer Network Distress Thermometer. Chi-square tests and Spearman Correlation tests were conducted where appropriate to explore relationships between different variables. **Results:** The prevalence of stress symptoms, anxiety symptoms, and depressive symptoms was 44% (39/89), 60% (53/89), and 84% (75/89), respectively, among the patients interviewed. Addiction history of the patients was an important association found in this study. **Conclusion:** The prevalence of stress and depressive symptoms was high among the oral cancer patients attending the Radiation Oncology OPD at our institution as well as levels of anxiety. Certain social variables such as relationship with spouse, children, and other family members had a profound effect on the mental well-being of the patients. Furthermore, certain factors such as addiction to tobacco and its different forms reduced the coping up capability of the patients.

Key words: Oral cavity cancers; Anxiety symptoms; Depression; Stress; Addiction

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INTRODUCTION

One of the most complex and anatomically dense regions in the body is our oral cavity with seven different subsites, namely the oral tongue, buccal mucosa, the upper and lower alveolar ridges, floor of the mouth, the lips, the hard palate, and the retromolar trigone. It is responsible for important functions such as speech/articulation, swallowing, and facial expression. Therefore, when a patient develops a cancer in this critical region, it is undoubtedly going to cause a lot of discomfort and feeding difficulties. Facial cosmesis is distorted, giving rise to a feeling of low self-

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esteem, self-pity, social rejection, stigma, and a feeling of social isolation, leading to considerable physical as well as mental morbidity of the patient.

Oral cavity cancers are the 17th most common cancers among men and women worldwide. Global data show a whopping number of 377,713 new cases being diagnosed each year and a serious number of 177,757 cases succumbing to the disease each year with a significantly high 5-year prevalence rate.[1] However, in India, these figures represent a different dimension of the disease altogether. A recent national representative survey of cancer mortality in India demonstrated oral cavity cancer as the leading cause of mortality in men which was responsible for cancer-related deaths in 22.9% deaths, that is, almost 1 in 5 deaths due to this disease. The regional spread of the disease varied from 43.6% in Mumbai to 96.1% in Dibrugarh (ICMR Report 2009–2011).

It is a truth universally acknowledged that the diagnosis of cancer is a huge stress for both at the individual level and at the family level leading to a downfall of the mental health of the patients and letting depression and anxiety seep in.[2] This development of anxiety and depression may be causal in interfering with the ability to adapt to the stress of life-threatening illnesses. For example, the length of hospitalization, the financial burden, treatment compliance, quality of life, and survival time are all compromised as a result of such problems for patients fighting with cancer.[3-5]

Numerous factors have been implicated in being related to the occurrence of anxiety, stress, and depression among patients fighting for their lives with cancer. Studies have shown that factors such as age, gender, education level, companionship, ability to keep down a proper job, and others have significant associations with the negative moods of the patients.[6-9]

As researchers are increasingly recognizing the value of mental health of individuals with cancer, disbursing and allaying the fears of the patients and thereby, reducing the symptoms of anxiety and depression has been an important challenge. The aim of this current study is to explore the prevalence of stress, anxiety, and depression in patients of oral cavity cancer and to find key factors that have may help us to predict these negative feelings in advance and add quality to the lives of our patients.

Aims and objectives

Through this research work, we wanted to explore the prevalence of mental health issues like stress, anxiety and depressive symptoms in patients at diagnosis with oral cancer. We also wanted to figure out certain key variables that have potential to predict such occurrences and were causative for these negative symptoms.

MATERIALS AND METHODS

Settings of the study

This cross-sectional study was a monoinstitutional observational study, conducted in Medical College, Kolkata, one of the largest tertiary care hospitals, located in Kolkata, West Bengal, Eastern India. Data were collected from the patients attending the out-patient department of Radiation Oncology between April 1st, 2022, and March 31st, 2023, that is, for a period of 1 year. The current research has received approval from the Institutional Ethics Committee, vide Ref no. MC/KOL/IEC/NON-SPON/1853/04/2023 dated April 19, 2023.

Subjects

The inclusion criteria were patients (1) aged 18 years or above; (2) had been diagnosed with oral cancer for the first time; (3) patients currently undergoing treatment; (4) patients aware of their own diagnosis; and (5) the educational level good enough to understand and complete the questionnaires.

The exclusion criteria were (1) patients with previous history of mental and cognitive disorders; (2) poor educational status or illiteracy; and (3) comorbid with other oral diseases or other cancers.

Each participant was limited to completing the survey only once. The sample size calculation was made by the formula: $n=(Z^2\times PQ)/L^2$, where Z=1.96=a constant, L=Absolute error of precision=10%, P=36.9% prevalence, as found in a study by Yuan et al.,[10] Q=100–P. Putting in the respective values, we arrive at a minimum sample size of 89, including a 10% value for patients lost to follow-up or invalid questionnaires.

Procedure

Entire process of the study was anonymous and voluntary for the participants. Each participant was given the opportunity to complete the survey only 1 time. Investigators comprised the primary investigator as well as the coinvestigators. Before filling in the questionnaires, each participant was requested to sign the consent form. The investigators were responsible to read and provide explanations for questionnaire items without any inducement. Microsoft Office Excel 2021 was used for data entry and to double-check errors.

Tools

Demographic and clinical characteristics composed of a simple question-answer leaflet. Demographic characteristics consisted of age, gender, cohabitation status, education level, occupation, and addiction history and alcohol consumption. Clinical variables were made up

by the sub-site of oral cavity cancer, family history, and whether they had distant metastasis.

Measurement of stress, anxiety, and depression symptoms

The depression, anxiety, and stress scale 21 (DASS-21) and the National Comprehensive Cancer Network (NCCN) distress thermometer, version 2.2023, were used to assess the anxiety, stress, and depression symptoms of the patients. The DASS-21 items are basically set of three scales, which the patients report themselves. It is designed in a way to measure the negative states of stress, anxiety, and depression. Each of these three scales contains seven items, divided into sub-scales with similar content. The depression scale assesses the loss of interest/involvement in activities of daily living, lack of initiative for any activity or inertia, anhedonia, persistent low self-esteem, and also includes changes in sleep patterns, eating, etc. The anxiety scale assesses strong feelings of worry or fear, panic attacks, etc. The stress scale assesses difficulty relaxing and a perceived feeling of an individual getting caught between the demands placed on him/her and his ability to meet those targets. Scores for depression, anxiety, and stress are calculated by summing the scores for the relevant items. A score of >10 signifies beginning of depressive symptoms, >8 score signifies anxiety, and >14 indicates stressful behavior.

The NCCN distress thermometer, version 2. 2023, assesses the distress level of the patients. Distress is a continuous scale ranging from normal feelings of vulnerability, tension and grief to uncontrollable symptoms of anxiety, existential crisis, or even spiritual crisis. It affects the way of thinking, feeling, and making it harder to cope with having cancer, its symptoms, or its treatment. It is a scale of 0–10 ranging from no distress to extreme distress.

Statistical analysis

The Statistical Package for the Social Sciences (Version 23.0) was used for the statistical analysis of the data. The Chi-square tests and Spearman Correlation tests were used, wherever necessary to find correlations between different variables. The significance for all statistical tests was set to be the level of 0.05. Chi-square test was operated to describe distributions of stress symptoms, anxiety symptoms, and depressive symptoms in categorical demographic and clinical variables.

RESULTS

Descriptive statistics

In the current study, 110 questionnaires were distributed. Among them, 89 were considered valid, yielding an effective response rate of 80.9%. Altogether, 75 male and 14 female patients participated.

The prevalence of stress symptoms, anxiety symptoms and depressive symptoms were 44 % [39/89], 60% [53/89] and 84% [75/89] respectively, among the patients interviewed. Furthermore, 53 respondents reported all the three symptoms of stress, anxiety and depression.

The demographic variables of the patients are described in Tables 1-3. The mean age of the participants was 48.67 years. Almost 59% of the respondents belonged to the age group 40-60 years, while the distribution of patients less than 40 years and more than 60 years, was almost similar, about 20-21% [Figure 1]. Most of the patients affected were males (84%) while 16% were females [Figure 2]. 56% patients were Hindus and 44% were Muslims, which showed that almost all religions were equally affected by cancer [Figure 3]. All the patients were married. All the patients had non-metastatic disease at the time of conduction of the interview.

The presence of addiction to smoking and other various forms of chewable tobacco was a highly significant factor in our research.

Association of stress, anxiety, and depressive symptoms

Chi-square test was conducted to identify the association of anxiety, stress and depression symptoms with various factors. No significant difference was found in the association of any particular gender, religion or age group [Tables 4-6]. But it was seen that married couples were better able to cope up with the stress of having cancer, though this was not evaluated in details in this study. A good family support, coupled with somewhat better financial background, gave the patients hope and optimism to deal with this stress better and reduce their distress, as evident from evaluation of the NCCN distress thermometer [Table 7]. A history of addiction to varied forms of chewable and smoked tobacco

Table 1: Age distribution of the subjects

Age group (years)	Frequency
<40	19
40–60	52
>60	18

Table 2: Gender-wise distribution of the study subjects

Gender	Frequency
Male	75
Female	14

Table 3: Distribution of patients among different religious groups

Religion	Frequency
Hindu	50
Muslim	39

Table 4: Association of depression with different independent variables

Independent	Variables	Yes (84%)	No (16%)	Chi-square statistic	P-value
Age group (years)	<40	14	5	3.64	0.162
	40–60	47	5		
	>60	14	4		
Gender	Male	64	11	0.41	0.524
	Female	11	3		
Religion	Hindu	44	6	1.92	0.166
	Muslim	30	9		

Table 5: Association of stress with different independent variables

Independent variables	Yes (44%)	No (56%)	Chi-square statistic	P-value
Age group				
<40	11	8	2.38	0.304
40–60	22	30		
>60	6	12		
Gender				
Male	33	42	0.01	0.939
Female	6	8		
Religion				
Hindu	19	31	1.03	0.311
Muslim	19	20		

Table 6: Association of anxiety with different independent variables

Independent variables	Yes (60%)	No (40%)	Chi-square statistic	P-value
Age group (years)				
<40	14	5	2.78	0.249
40–60	27	25		
>60	11	7		
Gender				
Male	42	33	2.49	0.114
Female	11	3		
Religion				
Hindu	31	19	0.28	0.594
Muslim	22	17		

Table 7: Spearman's correlation coefficients of NCCN score with different level of depression, stress, and anxiety

NCCN Score	Depression	Stress	Anxiety
Correlation coefficient	0.756**	0.410*	0.622**
P-value	<0.001	0.022	<0.001

*Significant at 5% level, **Significant at 1% level

Table 8: Association between depression and addiction history

Addiction	Yes	No	Chi-square statistic	P-value (Asymptotic significance)
1. Alcohol	6	0		
2. Chewable tobacco	25	4	9.96	0.012
3. Smokable tobacco	8	6		
4. Others (2 or more forms of addiction)	36	4		

Table 9: Association between stress and addiction history

Addiction	Yes	No	Chi-square statistic	P-value (asymptotic significance)
1. Alcohol	0	6		
2. Chewable tobacco	29	15	16.49	<0.001
3. Smokable tobacco	17	8		
4. Others (2 or more forms of addiction)	43	12		

Table 10: Association between anxiety symptoms and addiction history

Addiction	Yes	No	Chi-square statistic	P-value (Asymptotic significance)
1. Alcohol	0	6		
2. Chewable tobacco	37	15	23.95	<0.001
3. Smokable tobacco	24	9		
4. Others (2 or more forms of addiction)	28	6		

was significantly associated with more distress and other negative symptoms [Tables 8-10]. However, the degree/intensity of addiction was not evaluated in this study.

DISCUSSION

The current study explored the prevalence and predictors of stress, anxiety, and depressive symptoms in patients with oral cavity cancer attending one of the biggest tertiary care hospitals of Kolkata, India. Not surprisingly, the prevalence of stress symptoms was high in the current research, at a 44%. The prevalence of depressive symptoms was a whopping 84% and the prevalence of anxiety symptoms was 60%. This phenomenon is obvious and somewhat expected, particularly in patients of oral cavity cancer patients due to facial deformity, disfigurement, and dysfunction and can be explained as the assumption that anxiety is likely to be caused by the sense of uncertainty about the treatment and its outcome while battling the fear of social stigmatization and familial difficulties, while depression can be due to losing hope for the future and meaning of life.

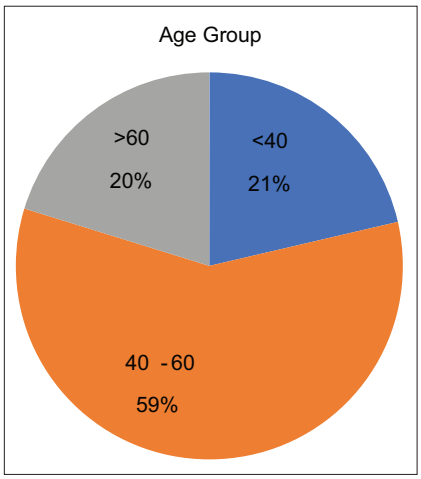

Figure 1: Pie-chart representing the age-group distribution

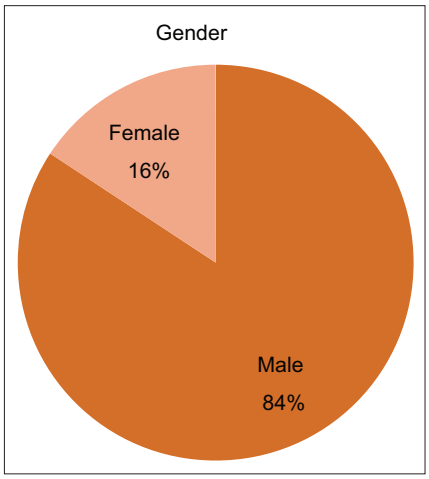

Figure 2: Pie-chart representing the gender distribution

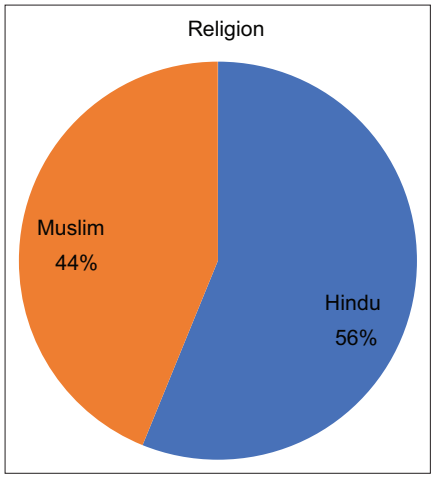

Figure 3: Pie-chart representing the findings in Table 3

Regarding different sociodemographic variables, it was found that the results were not significant for any particular age, sex, or religion. However, it was observed to be highly significant for people with an addiction history. It might be a possibility that withdrawal from addiction had a play in the development of anxiety and stress symptoms over a period of time which gradually led to stress and with time and depression. It was also found that even after repeated counseling, some patients continued to smoke to relieve their stress, much to the chagrin of their spouses and caregivers. This is the aspect which we encountered frequently during our research.

It was also seen that married patients with good family support were more optimistic about their prognosis and better able to deal with the regular journey to and from the hospital, more compliant with their medications and treatment schedule and more eager to communicate with the doctors regarding management of their disease. This fact has also been highlighted by other research as well.[11,12]

Hopelessness, which some patients felt, due to their advanced disease and disfiguring surgery, was increased by their inability to eat properly and also fear of social stigmatization, which is quite prevalent in our country, due to lack of mass awareness about cancer.[13] Some patients with poor economic background were also worried about being a financial burden on their families, which intensified depression and distress.

It was also found that the distress of a patient directly correlated to his development of negative symptoms such as anxiety, stress, and ultimately culminated into clinical depression. The Spearman correlation analysis found that NCCN score of distress was directly related to the development of negativity and highly significant at a $P<0.001$.

Significance

This current study aims at identifying the possible influencing factors associated with anxiety, stress, and depressive symptoms in patients with oral cavity cancer. The sociodemographic, clinical, and psychological variables were analyzed, and some significant results were obtained. It is highly recommended that all clinicians and nursing personnel should make a complete assessment of patients' information, especially their psychological status, before starting treatment, during the course of treatment, and also definitely after the treatment course is completed successfully. In addition, it is now heartily accepted that patients' social, spiritual, emotional, and psychological well-being are important aspects of the multidisciplinary approach to the treatment of oral cancers.

Health education, psychotherapy, cognitive behavioral therapy, and supportive and group interventions can be effective in allaying these negative symptoms, as reported by many studies. In this sense, our research further suggests the possibility of de-addiction education and encouraging

group therapy, infusing realistic hope and optimism, may be really worthy of use in oral cancer patients.

Limitations of the study

Due to the cross-sectional nature of the study, the causal relationship could not be confirmed. Future research by means of longitudinal studies should be done to shed more light on this aspect of psycho-oncology. Besides, only limited variables were focused on in this study, which leaves a huge scope of further research. Our study sample was also relatively small and the time-period of the study short, due to logistics and other constraints. The severity of addiction was also not evaluated in this study. However, despite its limitations, our research provided some theoretical and clinical implications and suggests some potentially better ways to reduce depressive symptoms through modifying both the negative and positive factors.

CONCLUSION

Though the association of the severity of addiction disorder with mental health problems was not evaluated in-depth in this research work, this is a facet of psycho-oncology which is bound to generate further research potential. It cannot be emphasized enough that a strong mental health framework of a cancer patient is as much of a weapon in his treatment arsenal as much as the other treatment modalities like chemotherapy and radiotherapy. So it is of paramount importance to keep the mental health of the patient elevated and buoyant at all times to picture an all-round recovery.

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SR, DB, NM, SH, ARD, SP- Conception and design; **SR, DB, SP-** Analysis and interpretation of the data; **SR, DB, NM, SH, ARD, SP-** Drafting of the article; **SR, DB, NM, SH, ARD, SP-** Critical revision of the article for important intellectual content; **SR, DB, NM, SH, ARD, SP-** Final approval of the article.

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