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Anxiety, Depression, Stress and Resilience in Cancer Patients

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Abstract

Background: 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.

Aim: To assess the relationship of stress, anxiety, resilience and relationships to depression among cancer patients.

Methods: All patients taking oncology treatment from two tertiary care hospitals were included in the study with their consent. Patients suffering from comorbid medical or psychiatric disorders were excluded. Socio demographic and clinical details of the patients were recorded and the relationship scale, depression anxiety stress scale (DASS) and Abbreviated Connor-Davidson Resilience Scale was administered. The scores were scored as per the test manual, the data tabulated and analyzed using the spss software.

Results: The study sample included 221 subjects with confirmed diagnosis of cancer. Based on the DASS significant stress anxiety depression was found in 4.07%;18.09%; and 29.41% cancer patients respectively. Multiple linear regression analysis indicated that stress, anxiety, resilience and relationships are important factors in predicting depression.

Conclusion: Psychiatric morbidity in the form of depressive and anxiety disorders is very common among patients with cancer. In addition to reducing depressive and anxiety symptoms, resilience development should be included in depression and anxiety prevention and treatment strategies. Close liaison between Oncologists and Psychiatrists may improve the outcome of patients with cancer.

Keywords: Malignancy; Depression; Anxiety; Stress; Resilience

Introduction

The initial diagnosis of cancer elicits few characteristic responses from the patient, most commonly disbelief, denial, and despair that can last from days to weeks [1]. This is usually followed by depression, anxiety, appetite changes, insomnia, or irritability which may last for weeks or even months. However, gradually most people are able to adjust to the condition and its treatment and return to a new baseline, sometimes referred to as a "new normal." [2]. The terror elicited by cancer was due to its association with pain, disability and death. Even though as a result of advances in cancer treatment about half of newly diagnosed patients with cancer can expect to survive for at least 10 years [3].

As per the Psychosocial Collaborative Oncology Group study 53% of adults suffering from cancer adjusted normally to the disease. The rest developed various psychiatric disorders, most commonly Adjustment disorder with depressed and/or anxious mood [4]. Other studies reported that 10% and 34% of cancer patients develop psychiatric disorders including adjustment disorder, major depression, delirium, and anxiety disorders [5-10]. The emotional reaction to cancer in the form of depression and anxiety are often believed to result from the psychological reactions of the patient to diagnosis of cancer, its treatment, survivorship or end of life care [11]. Adverse effects of the disease on longevity, on work and social roles along with losses intrinsic to treatment (such as body parts, organs, hair, or sexual function), can initiate prolonged periods of psychological stress. Extended periods of stress can produce physiological effects (such as hypothalamo-pituitary-adrenal axis activation), escalating to psychological symptoms that reach diagnostic thresholds for depression or anxiety [12]. Other demographic

factors like age may also affect the occurrence of psychiatric symptoms and disorders. For example, one study reported that older in men with prostate cancer were less anxious and had better emotional quality of life than younger men but had more symptoms of depression [13]. Another study in older male and female cancer patients concluded that older patients had less anxiety, but their depression remained unchanged with increasing age [14]. Other studies reported contrary findings [15].

There is paucity of Indian studies that have assessed the levels of anxiety, depression, stress and resilience in cancer patients. Keeping this in view, the above study was undertaken to assess the levels of levels of anxiety, depression, stress and resilience in cancer patients undergoing radiotherapy and chemotherapy.

Material and Method

This prospective cross-sectional analytical study was conducted at Rural Medical College, Loni and Dr D Y Patil Medical College by department of Psychiatry in collaboration with Radiotherapy, Medicine, Surgery and Obstetrics and Gynecology departments.

Study Population

Cancer patients taking oncology treatment during the study period and meeting the inclusion and exclusion criteria of the study were included in the study.

Inclusion Criteria

i. All the patients with confirmed diagnosis of Cancer undergoing treatment.

ii. All the patients ready to give their consent.

Exclusion Criteria

i. Patients suffering from co-morbid chronic medical disorder.

ii. Patients with a history of mental illness or suffering from a psychiatric disorder.

iii. Patients with previous or current use of sleep medications.

Tools Used in the Study

i. Customized Questionnaire which includes various demographic variables like sex, age, education, religion, occupation, number of children, marital status and relationship status.

ii. Depression, Anxiety, Stress Scale (DASS) The DASS is a 21 item self-report inventory that yields three factors: Depression; Anxiety; and Stress. Reliability of the three scales is considered adequate. Test-retest reliability is adequate with 71 for depression, 79 for anxiety and 81 for stress. Exploratory and confirmatory factor analyses have sustained the proposition of the three factors ($p < 0.05$). The DASS anxiety scale correlates 0.81 with the Beck Anxiety Inventory, and the DASS Depression scale correlates 0.74 with the Beck Depression Scale [16-17].

iii. The Abbreviated Connor- Davidson Resilience Scale (CD-RISC2) The CD-RISC2 is a 2-item version of the Connor-Davidson Resilience scale. It has internal consistency, test-retest reliability, convergent validity, and divergent validity as well as correlation with full scale [18].

Procedure

All patients with confirmed diagnoses of cancer and undergoing treatment were approached to take part in the study. The purpose of the study was explained to them and they were included in the study after taking their written informed consent. Initially the demographic and clinical details of the subjects were recorded in the case record form and relationship questionnaire was completed. Thereafter the DASS and CD-RISC2 were applied individually to the patients. The scales were scored as per the test manual. The collected data was tabulated for analyzed.

Statistical Analysis

All the data will be organized statistically in excel sheet by suitable statistical tests. Standard descriptive statistics will be used to analyze the sample characteristics, total scores, and selected item scores for each measure. A multiple linear regression analysis was run with depression as dependent variable and age, anxiety, stress, resilience and relationship as predictor variables.

Results

Table 1: Demographic and clinical characteristics of the cancer patients.

Characteristics of Cancer patients		Mean / Number	S.D./ percent
Age	**Mean (range) in years**	**52.62 (9-84)**	**11.26**
Gender	Male	74	33.48
	Female	147	66.52
Marital status	Married	199	90.05
	Unmarried	1	0.45
	Widow/Widower	21	9.50

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Education	Illiterate	106	47.96
	Up to class 5	35	15.84
	Class 6-10	57	25.79
	Classes 11-12	11	4.98
	>12	12	5.43
Religion	Hindu	187	84.62
	Muslim	30	13.57
	Others	4	1.81
Family type	Nuclear	111	50.23
	Joint	86	38.91
	Extended	24	10.86
Occupation	Farmer	129	58.37
	Housewife	51	23.08
	Service	26	11.77
	Trader	11	4.98
	Student	3	1.36
	Unemployed	1	0.45
Site of cancer	Ca Head & Neck	57	25.79
	Ca breast	72	32.58
	Ca cervix	47	21.27
	Other Genito-urinary Ca	12	5.43
	Others	33	14.93

Table 2: Scores obtained by the cancer patients on Depression, Anxiety, Stress, Resilience and relationship scales

	N	Mean	Std. Deviation
Depression	221	6.3348	4.72191
Stress	221	6.7647	3.90208
Anxiety	221	4.9412	3.37789
Resilience	221	4.8145	1.90620
Relationship	221	4.1946	4.56401

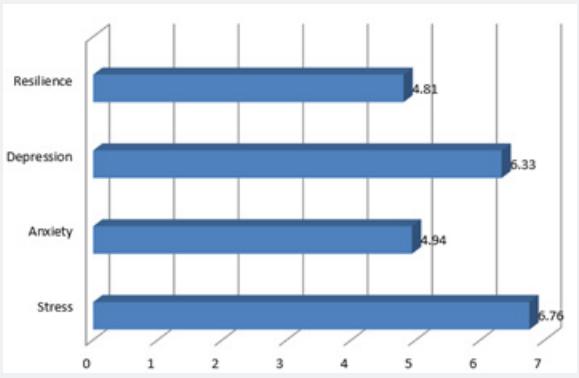

Figure 1: Mean values of resilience, depression, anxiety and stress in cancer patients.

Socio-demographic and clinical characteristics of the cancer patients are depicted in Table 1. Scores obtained by the cancer patients on Depression, Anxiety, Stress, Resilience and relationship scales are shown in Table 2. The number of patients having higher than normal levels of stress, anxiety and depression were 9 (4.07%) for stress; 40 (18.09%) for anxiety and 65(29.41%) for depression. Mean values of resilience, depression, anxiety and stress in cancer patients are given in Figure 1. Distribution of anxiety, depression and stress in cancer patients are shown in Figure 2.

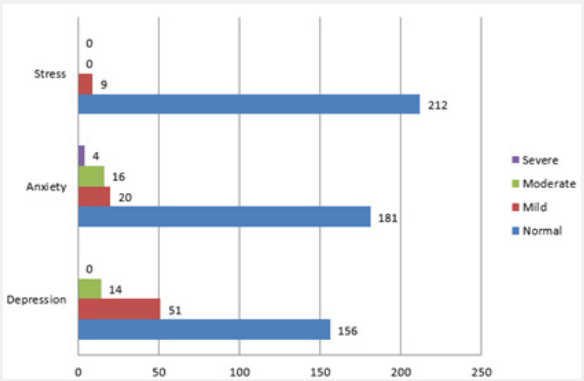

Figure 2: Distribution of anxiety, depression and stress in cancer patients.

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Table 3: Variables Entered/Removed.

Model	Variables Entered	Variables Removed	Method
1	Relationship, Age, Resilience, Anxiety, Stressa	.	Enter

a. All requested variables entered.

Table 4: Multiple linear regression model summaryb.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.749a	.561	.551	3.16304	2.052

a. Predictors: (Constant), Relationship, Age, Resilience, Anxiety, Stress
b. Dependent Variable: Depression

A multiple regression was run to predict depression from age, stress, anxiety, resilience and relationship. Table 3 tells us the variables entered in our analysis. Table 4 shows the multiple linear regression model summary and overall fit statistics. We find that the adjusted R^2 of our model is 0.551 with the R^2 = 0.561. This means that the linear regression explains 56.1% of the variance in the data. The Durbin-Watson d = 2.052, which is between the two critical values of 1.5 < d < 2.5. Therefore, we can assume that there is no first order linear auto-correlation in our multiple linear regression data.

Table 5: ANOVA[b].

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2754.183	5	550.837	55.057	.000a
	Residual	2151.039	215	10.005		
	Total	4905.222	220			

a. Predictors: (Constant), Relationship, Age, Resilience, Anxiety, Stress
b. Dependent Variable: Depression

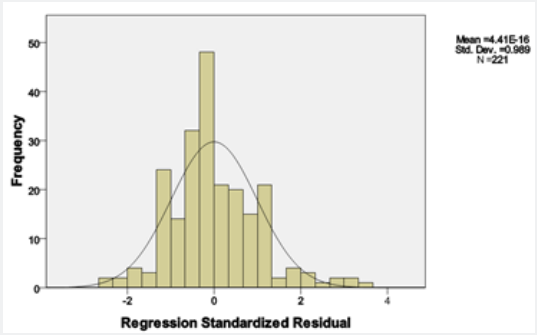

Figure 3: Histogram. Dependent variable: Depression.

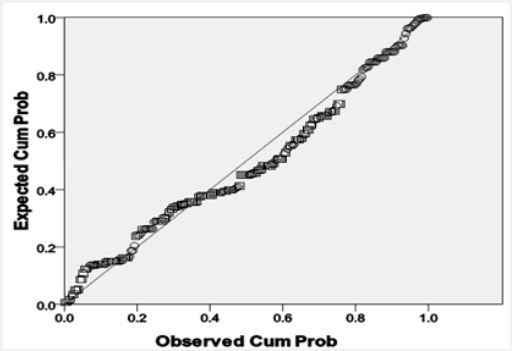

Figure 4: Normal P-P Plot of Regression Standardized Residual. Dependent variable depression.

Output Table 5 is the F-test. The linear regression's F-test has the null hypothesis that the model explains zero variance in the dependent variable (in other words R^2 = 0). The F-test is highly significant; thus, we can assume that the model explains a significant amount of the variance in depression rate. From Table 6 it is obvious that out of the predictor variables age is not significant indicating that age of the patient is not an important factor in predicting depression. Stress and anxiety are significant, and the coefficients are positive which indicates that greater the stress and anxiety, greater the depression. On the other hand, resilience and relationship are also significant factors but their coefficients are negative. This implies that higher resilience and

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better relationship is related to lower depression, which is what we would expect. The information in Table 6 also allows us to check for multicollinearity in our multiple linear regression model. Tolerance should be > 0.1 (or VIF < 10) for all variables, which they are. Age is therefore excluded from the model. Lastly, we can check for normality of residuals with a normal P-P plot. The plot shows that the points generally follow the normal (diagonal) line with no strong deviations. This indicates that the residuals are normally distributed (Figures 3 & 4).

Table 6: Coefficientsa and Collinearity statistics.

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig. Tolerance	Collinearity Statistics	
		Std. Error	Beta				VIF	
1	(Constant)	3.842	1.309		2.934	.004		
	Age	.009	.019	.022	0.480	.632	.974	1.027
	Stress	.509	.077	.420	6.627	.000	.507	1.973
	Anxiety	.411	.083	.294	4.918	.000	.572	1.749
	Resilience	-.602	.124	-.243	-4.865	.000	.817	1.223
	Relationship	-.134	.049	-.130	-2.727	.007	.901	1.109

a. Dependent Variable: Depression

Multiple Linear Regression Analysis

Table 7: Variables showing Multiple linear regression analysis.

Predictor variable	Beta	P
Stress	0.420	0.000
Anxiety	0.294	0.000
Resilience	-0.243	0.000
Relationship	-0.130	0.0

(Age was not a significant predictor in this model)

A multiple regression was run to predict depression from age, stress, anxiety, resilience and relationship. Using the enter method, a significant model emerged (F(5,215)=55.057, p<0.000).Adjusted R square = 0.561. Significant variables are shown below: (Table 7)

Discussion

A major finding of the present study was that the higher than 'normal' levels of depression, anxiety and stress was observed in 29.41%, 18.09% and 4.07% respectively of patients with confirmed diagnosis of cancer undergoing treatment in a tertiary care centre. This trend is in agreement but lower than number of studies. An earlier study involving 150 patients with recent diagnosis of cancer assessed with the Hospital Anxiety and Depression scale, reported mild and symptomatic anxiety in 29.3% and 16.7% patients respectively, while mild and symptomatic depression was observed in 26.7% and 21.3% patients respectively. Age of the patient was significantly related to anxiety and depression with higher frequency in older ages [19]. Similarly, in 50 patients with cancer , depression and anxiety was found in 44% of patients [1]. In a study from north Bengal out of 174 cancer patients, 97 (55.7%) were found to be depressed. Depression was associated with male gender, older age (≥50), non-Hindus, having higher education, and higher family income (≥5000 rupees/month) [20].

On the other hand, our findings are somewhat in disagreement with few studies that reported lower levels of depression and anxiety. An earlier Indian study reported that 21.5% out of 270 cancer patients had depression [21]. In another study a total of 117 patients were evaluated by using distress inventory for cancer and hospital anxiety and depression scale. The mean distress score was 24. A total of 18 (15.38%) were found to have anxiety while 19 (16.23%) had depression. High social status was the only factor found to influence distress while female gender was the only factor found to influence depression [22].

A systematic review and meta-analysis of 70 studies involving 10,071 patients across 14 countries revealed that the prevalence of major depression was (14.9%), minor depression (19.2%), anxiety (10.3%) and dysthymia (2.7%) in patients treated for cancer.4 The prevalence of depression in cancer patients was not affected by age, sex or clinical setting [23].

An important factor contributing to the variability in psychological adjustment after cancer treatment is resilience or the capacity to maintain or recover well-being in the face of adversity. The highly resilient person is capable of adapting to adverse or tragic events [24]. It has been suggested that psychological resilience or the positive adjustment outcomes to the exposure of adversity is an important protective factor for combating stress in cancer patients. Studies also indicate that resilience is associated with better adaptation and lower levels of psychological distress in the medium and long term in patients with cancer [25].

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Resilient individuals are believed to have the ability to cope and adjust better to traumatic events and therefore reduce the danger of developing anxiety and depression [26]. Few studies have shown that resilience can be helpful in improving anxiety, depression, and quality of life in patients facing adversity [27]. Another important finding of our study was that in the cancer patients' stress and anxiety are positive predictor of depression. But resilience and relationship are negative predictor of depression. Our findings agree with a recent study in which 327 bladder cancer patients and 268 renal cancer patients completed questionnaires on demographic variables, Zung Self-Rating Anxiety Scale, Center for Epidemiologic Studies Depression Scale, Resilience Scale-14, and Perceived Stress Scale-10. Based on the results of the tests they concluded that in bladder cancer patients the prevalence of anxiety and depression was 71.3% and 78.0% while in renal cancer patients it was 68.3% and 77.6% respectively. Psychological stress was positively related to symptoms of depression and anxiety, while resilience was negatively related to these symptoms. The relation of psychological stress with anxiety and depression was partially medicated by resilience [28].

Factors reported to decrease the risk of developing depression in individuals suffering the stress of cancer include personality and demographic characteristics such as spirituality, hopefulness and family relationships [29-31]. Studies have confirmed these factors as predictors of the occurrence and severity of anxiety and depression in individuals with cancer [31-33]. Based on this line of research it may be postulated that a person with good family relationships may be more resistant to developing depression following stress of cancer than a person who has lacks this characteristic. The finding of the present study is consistent with the above.

The present study in agreement with few earlier studies suggests that psychiatric morbidity in the form of depressive and anxiety disorders is fairly common among patients with cancer. In addition to reducing depressive and anxiety symptoms, resilience development should be included in depression and anxiety prevention and treatment strategies. Accordingly, there is a need for close liaison between oncologists and Psychiatrists to improve the outcome of patients with various malignancies.

Conclusion

The prevalence of depression, anxiety and stress is high among hospitalized cancer patients. Stress, anxiety, resilience and relationships are important factors in predicting depression.

Implications

i. Depression in cancer patients needs to be identified as it has major implication in the course and prognosis of illness.

ii. Data from various studies have convincingly documented that once an individual is diagnosed with cancer, psychological factors may influence the course of illness and also overall quality of life.

iii. Concurrent psychiatric counseling will improve the quality of life of such patients.

iv. Psychiatric therapy of cancer patients apart from combating depression, anxiety and stress, should also attempt to improve resilience in these patients.

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