Assessment of depression among patients receiving chemotherapy in tertiary care cancer hospital, Karimnagar, Telangana

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Abstract
Background: Depression is a mood disorder characterized by persistently low mood and a feeling of sadness and loss of interest. Depression is common among cancer survivors. The fear of cancer recurrence, the lingering physical effects of past treatments or survivor guilt may make you susceptible to depressive thoughts or emotions. **Objective:** To study the prevalence of depression among cancer patients receiving chemotherapy. **Methodology:** A cross sectional descriptive study in which 402Cancer patients participated for the study, in which 125 males and 277 females were chosen by Random sampling method. Data were collected by using BEDS (Brief Edinburg Depression Scale) and analyzed by using proportions, Chi-square test and ANOVA using SPSS version 23. P-value less than 0.05 was set to be statistically significant. **Result:** Out of 402cancer patients participated in the study 31.01% males and 68.99% were females. The mean age of male is 55.82 ± 13.26 and that of female is 51.70 ± 11.74. The prevalence of Depression was 41.93% and which is higher in age group ≥ 50 Years and also comparatively more in female than male. **Conclusion:** The results of this study confirm that cancer patients receiving chemotherapy do suffer from depression. Hence various psychiatric treatment approaches' like psychological Counselling, group sessions, and even medication in the form of anti-depressants are to be included in the treatment once the patient is diagnosed with cancer.
Key Word: Cancer patients, Brief Edinburg Depression Scale, psychological

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INTRODUCTION

Among non-communicable diseases, cancer is responsible for the second highest mortality in the country next to cardiovascular diseases[1,3] Cancer is well known to be a difficult disease, affecting patients and their families both physically and emotionally[4]. The leading cause of death in economically developed countries, and the second leading cause of death in developing countries is reported to be cancer[5].Breast cancer, cervical cancer and cancer of the esophagus were the most prevalent forms of cancer. Patient diagnosed with cancer commonly having depressive symptoms (Kim *et al.*, 2006). About 15- 25% of cancer patients are affected by depression reports by The National Cancer Institute (2008) (Bayer, 2009). Chemotherapy is a type of cancer treatment that uses drugs to destroy the cancer cells. The cancer patient receiving chemotherapy may lead to depressive symptoms and worsening during chemotherapy (Polikandrioti *et al.*, 2008). According to National Cancer Registry (2011). Depression is a mood disorder characterized by persistently low mood and a feeling of sadness and loss of interest. Depression is common among cancer survivors. Most patients experience some level of distress however only a small percentage receives help. Distress is on unpleasant

emotional, psychological, social or spiritual experience that interferes with the patient ability to cope up with cancer treatment. Patients may experience a range of feeling from normal sadness and fear to deep depression, anxiety, panic or isolation. Distress may become disabling at the time of diagnosis, during cancer treatment, at the end of the long course of treatment A long course of treatment, repeated hospitalizations, and the side-effects of chemotherapy along with the stigma of being diagnosed with cancer has a significant effect on the psyche of the cancer patients.[6], when the cancer returns or when beginning palliative care. Patients who experiencing moderate to severe distress may require a referral to mental health professionals such a psychiatric nurse, psychologist, psychiatrist, social worker or pastoral counsellor[7]. Untreated depression leads to personal suffering and increased mortality. Some study shows that prevalence depressive symptoms among female is more than that of the male, but in some studies shows its higher in male than female. On other side depression level decreases inversely with increases of age (Miaskowski, 2004)[8-9]. There are very few studies published on to find magnitude of depression among cancer patient receiving chemotherapy. The aim of this study to find out prevalence of Depression among such cancer patients who are receiving chemotherapy at Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar, Telangana State.

METHODOLOGY

A cross-sectional study was conducted at the Chalmeda Cancer Hospital in the Department of Oncology, NABH, Karimnagar, Telangana state during September 2017 to December 2017. A total of 403 cancer patients were interviewed after obtaining Informed consent and Institutional Ethics Committee Clearance. Brief Edinburgh Depression Scale was used to find out depression with a score of 6 and above indicating depression.

Inclusion Criteria
- Age between 10 to 90 Years old.
- Cancer patients undergoing Chemotherapy
- Those were willing to participate.

Exclusion
- Those who undergoing Radiotherapy.

Sample Size: The sample size were calculated on the basis of previous prevalence of Depression among cancer patients was found 29%,[8] Confidence interval of 95% and margin of error 5%, then sample size was calculated by using formula as

$$n = \frac{Z^2 pq}{(ME)^2}$$

Where, Z = Normal Deviate (1.96)
P = previous prevalence (29%),   q = (1- p)
ME = Margin of Error

$n = \frac{1.96^2 * 0.29 * 0.71}{(0.05)^2} = 316$ Further more 30% extra for non-response of data, so the final sample size was **402**

Data Collection: Cancer patients coming to the Chemotherapy Day Care were interviewed using the questionnaire. The information was further validated from existing records of the patients. While assessing the depression using the BEDS, the patients were asked to suggest the answer, among the available options for each question, on the basis of how they felt in the month before the interview. The options for each question were interpreted to the patients to obtain the most accurate answer. A subject once interviewed was not interviewed again on his/her subsequent visits to the center.

Data Analysis: Collected data were enter in to the Spread sheet format for further statistical analysis using Microsoft Excel 2010, Qualitative and qualitative data was analyzed by using Descriptive statistics and proportions, Chi-square and ANOVA were used to see association and differences by using SPSS Version. 23. P-value less than 0.05 was set to be statistically significant.

OBSERVATION / RESULT

A total of 402 cancer patients were interviewed after obtaining Informed consent and Institutional Ethics Committee Clearance. Brief Edinburgh Depression Scale was used to find out depression with a score of 6 and above indicating depression. Data obtained was analysed and following results were obtained Out of the 402 respondents in the study, there were 125(31.01%) male patients and 277(68.73%) female patients. 198 (49.13 %) of the patients involved in this study were 46 - 60 years of age, followed by 106 (26.3%) were below 45 years age and 99 (24.57%) of above 60 years old. About education, 322(79.9 %) were illiterate, 81 (20.1%) literate and 81 (20.1%) were literate. If we see the monthly family income 244(60.54%) have their family income Rs ≤5000 and 159(39.45) having their monthly income Rs. ≥ 5000. Based on data of chemotherapy during the study, 80.89% of the patients are receiving chemotherapy and 19.11% were not receiving chemotherapy, about chemo cycle, 21.83% were in the < 2 cycle, 33.74% were in the 2 - 4 cycle, 25.3% were in the >4 , and 54.1% was in the fourth cycle and above (See Table 1). In the present study overall depression found was 42.03 %, in different age group of participants, 21.34 % of the patients of 46 – 60 years age group found in depression from which 10.17% , 6.20% and 4.96% patients were at mild, moderate and high level respectively, followed by 12.66% from which 4.96% , 5.47% and 2.23% patients were at mild, moderate and high levels respectively, in age group ≤ 45 years and 7.94 % from which 3.23% , 2.48% and 2.23% patients were at mild, moderate and high levels respectively in age group ≥

60 years of age. This association between age group and levels of depression was statistically not Significant statistically Gender wise it was seen that out of total 30.27% female from which 12.66%, 10.42% and 7.20% patients were mild, moderate and high levels of depression, on other hand 11.66% from which 5.71%, 3.72% and 2.23% patients were mild, moderate and high levels of depression among male patients, though this difference was not significant statistically. During the chemo cycle, those who were received >4 chemo cycle were found more in depression which was 15.5% from which 6%, 6.2% and 3.2% patients were at mild, moderate and high levels of depression, followed by, 11.2% in <2 chemo cycles, 6.7% in 2 – 4 Cycles. Patients those were receiving chemo for breast cancer in female, found more 13.4 % of depression from which 5.5%, 4.2% and 3.7% of depression at mild, moderate and high levels were observed, followed by GI Cancer which was 11.4%, Genital Cancer which was 8.2%, Lung cancer ie. 2.2%, Blood cancer and other which was 0.7%, 6.0% respectively. (See Table No 2.) Depression score by using BEDS (Brief Edinburgh Depression Scale) scale for different variable shown in Table No. 3.

Table 1: Socio-Demographic Distribution of Depressive Patients.

Variable	No. of Patients	Depression
Age		
≤45	106 (26.3%)	51 (12.66%)
46-60	198 (49.13 %)	86 (21.34%)
>60	99 (24.57%)	32 (7.94%)
Sex		
Male	125(31.01%)	47(37.6 %)
Female	277(68.73%)	122(53.7%)
Caste		
FC	40(9.9)	15(37.5)
BC	236(58.5)	99(41.9)
SC/ST/Others	127(31.5)	55(43.3)
Educational Status		
Illiterate	322(79.9)	138(42.9)
Primary	44(10.9)	20(45.5)
Secondary and above	37(9.18)	11(29.72)
Monthly Family Income (Rs)		
≤5000	244(60.54)	87(35.65)
>5000	159(39.45)	75(47.16)
Physical Activity Status		
Sedentary	142(35.23)	59(41.54)
Moderate	211(52.35)	86(40.75)
Heavy	31(7.69)	14(45.16)
None	19(4.71)	10(52.63)
Living With Family		
Yes	380(94.29)	160(42.10)
No	23(5.70)	9(39.13)
Chemotherapy		
Yes	326(80.89)	136(41.71)
No	77(19.10)	33(42.85)
Chemo Cycles		
No Cycles	76(18.90)	32(42.10)
<2 Cycles	88(21.83)	35(39.77)
2-4 Cycles	136(33.74)	45(33.08)
>4 Cycles	55(13.64)	27(49.09)
>6 Cycles	47(11.66)	30(63.82)

Tables 2: Level of Depression among socio-demographic variables

Variable	Levels of Depression			Total	P-Value (X²-Square)
	Mild (%)	Moderate (%)	High (%)		
Age					
≤45	20 (4.96%)	22 (5.47%)	9 (2.23)%)	51 (12.66%)	
46-60	41 (10.17%)	25 (6.20 %)	20 (4.96 %)	86 (21.34 %)	0.46(NS)
>60	13 (3.23%)	10 (2.48%)	9 (2.23%)	32 (7.94 %)	
Gender					
Male	23 (5.71%)	15 (3.72%)	9 (2.23 %)	47 (11.66%)	0.67(NS)
Female	51 (12.66 %)	42 (10.42 %)	29 (7.20 %)	122 (30.27%)	
Chemo Cycles					
No Cycles	20 (5.0%)	10 (2.5%)	5 (1.2%)	35 (8.7%)	
<2 Cycles	18 (4.5%)	14 (3.5%)	13 (3.2%)	45 (11.2%)	
2-4 Cycles	12 (3.0%)	8 (2.0%)	7 (1.7%)	27 (6.7%)	0.719(NS)
>4 Cycles	8 (2.0%)	12 (3.0%)	10 (2.5%)	30 (7.4%)	
>6 Cycles	16 (4.0%)	13 (3.2%)	3 0.7%)	32 (7.9%)	
Type of Cancer					
Blood Cancer	2 (0.5%)	1 (0.2%)	0 (0.0%)	3 (0.7%)	
Lung Cancer	3 (0.7%)	5 (1.2%)	1 (0.2%)	9 (2.2%)	
Genital Cancer	15 (3.7%)	12 (3.0%)	6 (1.5 %)	33 (8.2 %)	0.62(NS)
GI Cancer	22 (5.5 %)	13 (3.2%)	11 (2.7%)	46 (11.4%)	
Breast Cancer	22 (5.5%)	17 (4.2%)	15 (3.7%)	54 (13.4%)	
Other	10 (2.5%)	9 (2.2%)	5 (1.2%)	24 (6.0%)	

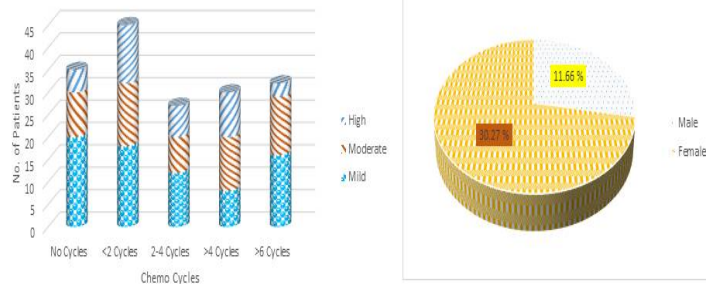NS: Non Significant at 5% level of Significance

Figure 1: Level of Depression during chemo cycles; **Figure 2:** Depression in Gender

Tables 3: Mean Depression Scores among the variables

Variable	N	Mean Score	SD	P-Value
Age				
≤45	51	8.8039	2.53787	
46-60	86	8.6279	2.73129	0.92(NS)
>60	32	8.625	2.47243	
Gender				
Male	47	8.4043	2.45534	0.39(NS)
Female	122	8.7869	2.67288	
Occupation				
Unskilled	109	8.5321	2.5187	
Semi-Skilled	48	8.6667	2.66045	0.29(NS)
Skilled	10	10.2	3.45768	
Professional	2	9	0	
Type of Cancer				
Blood Cancer	3	7.6667	1.1547	
Lung Cancer	9	8.6667	2.78388	
Genital Cancer	33	8.5758	3.05195	0.99(NS)
GI Cancer	46	8.7174	2.57909	
Breast Cancer	54	8.7222	2.46038	

Other	24	8.7917	2.63718	
Chemo Cycles				
No Cycles	35	8.3429	2.60026	
<2 Cycles	45	8.9333	2.9726	
2-4 Cycles	27	8.7778	2.75029	0.146(NS)
>4 Cycles	30	9.4667	2.44573	
>6 Cycles	32	7.875	1.89652	

NS: Non Significant at 5% level of Significance

DISCUSSION

According to study conducted by Inaba, *et al.*, 2005[10], the most of the cross study stated that woman, lower education person, low income, or occupational prestige have the higher risk for depressive disorder than man, and higher advantaged socioeconomic status (SES) position. In this study, the number of samples according to gender differences also had been observed where the majority of the samples are the woman than the mens, the similar finding with another study (Polikandrioti M, *et al* 2008)[11]. The statistical result showed that 57.96% did not have depression, 18.37% experienced mild dipression, and 14.14% had Moderate depression level and 9.43% associated with major depression level. There was no significant difference found between age, sex, marital status, and educational level in the study conducted by Rezaei, and Adib-hajbaghery (2008)[12].

Age: In the term of age in this study, younger patients are less depressed than older patients. (Fann, *et al.,* 2008)[13] In his study stated that younger patients have the higher risk of depression especially the first year after diagnosis of having breast cancer. However, no significant difference was found between level of depression and age in this study which is similar to Polikandrioti *et al.,* (2008)[11] who mentioned that his study does not show a direct association between depression level and age. The result of Lavdaniti, (2012)[14] also showed there was no statistically significant between depression and age. However, the study by Linden, *et al.,* (2012)[15] mentioned that there were higher prevalence rate of depression level among younger age cancer patients than lower prevalence rate of depression level in older age cancer patients (Linden, *et al.,* (2012) (Kim, *et al.,* 2006)[16]. The researchers believed that higher prevalence rate of depression level among younger age due to more disruption in daily life while the older age already had physical function impairments and they had prepared cognitively and emotionally in accepting the illness (Linden, *et al.,* 2012) (Polikandrioti *et al.,* 2008)[11].

Gender: From the analysis of the results, and in regard to gender, it was found that women experienced higher levels of depression with no statistically significant differences from men. The results of Keller's *et al.*[17], study, women are more likely to manifest depression compared to men. Another study conducted by Polikandrioti *et al.,* (2008)[11] that showed women experienced higher depression than

man but no significant statistics. The result of Farooqi, and Ahsan, (2009)[18]'s study also supported the result of this study.

Chemo cycles: In this study, there is no significant difference between depression and chemotherapy cycles observed (p value –0.71). This finding is consistent with Khudhair, (2009)[19] who mentioned that there were no significant differences found between depression level and chemotherapy cycle. The study conducted by Pandey, *et al.,* (2006)[5] showed that side effect symptoms pearance among cancer patients receiving chemotherapy. The symptoms are like tiredness, loss of appetite, dryness of mouth, nausea, and sleep disturbances. Fann, *et al.,* 2008[13] showed the same result where women who received chemotherapy reported more psychological distress and depression compared to those who did not receive chemotherapy.

Types of Cancer: In the present study, patients who were receiving chemo for breast cancer had more depression, which is supporting study conducted by Burgess C., *et al.*[20],50% of women with breast cancer in initiatory stage, experienced depression during the first year from diagnosis, 25% in the second, third and fourth year and 15% experienced depression during the fifth year from diagnosis. Furthermore, according to Okamura's *et al.*[21], study, 22% of patients with breast cancer experienced depression in the disease recurrence.

CONCLUSION

In the present study, the proportion of depression found in cancer patients receiving chemotherapy was 81.01% which is slightly more than the study conducted by Bhattacharyya, *et al.* and in another similar study depression was found to be 16.2% in cancer patients using the Hospital and Anxiety Depression scale. Keller and Henrich found female cancer patients were more depressed than the males which was similar in the present study. The results of this study confirm that cancer patients receiving chemotherapy do suffer from depression. Hence various psychiatric treatment approaches' like psychological Counselling, group sessions, and even medication in the form of anti-depressants are to be included in the treatment once the patient is diagnosed with cancer.

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