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### Correlates of depression among cancer patients

<sup>1</sup>P Yamini, <sup>2</sup>Manjula Patil and <sup>3</sup>Vinutha U Muktamath

<sup>1</sup>Ph.D. scholar, Department of Human Development and Family Studies, College of Community Science, University of Agricultural Sciences, Dharwad, Karnataka, India

<sup>2</sup>Associate professor, Department of Human Development and Family Studies, College of Community Science, University of Agricultural Sciences, Dharwad, Karnataka, India

<sup>3</sup>Department of Human Development and Family Studies, College of Community Science, University of Agricultural Sciences, Dharwad, Karnataka, India

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Corresponding Author: P Yamini

#### Abstract

A study was conducted to assess the influence of personal factors on depression among cancer patients at UAS, Dharwad during the year 2021-24 on a sample of 150 cancer patients (oral, gynecological and breast) from four hospitals of Dharwad city of Karnataka State and Hyderabad city of Telangana State. A self-structured questionnaire was used to gather personal information. Hospital Anxiety and Depression Scale was used to assess anxiety and depression among cancer patients. Frequency, percentages and chi-square test was used for data analysis. The results revealed a significant association between age, gender, education, occupation and depression of the patients in Hyderabad region. Patients who were in the age group of > 58 years had higher depression compared to those who were in 25-35 years of age group. Women had higher depression. In case of education, patients who were illiterates were in the category of abnormal depression whereas patients who were self-employed with income < 5k had higher level of depression. Hence, addressing depression in cancer patients is critical for their holistic care, improving quality of life, treatment adherence, physical health, social support, psychological resilience, and potentially even survival outcomes. It requires a comprehensive approach that considers the unique needs and circumstances of each patient.

**Keywords:** Depression, education, occupation, cancer patients

#### Introduction

Cancer, a complex and multifaceted disease, represents a significant global health challenge characterized by the abnormal and uncontrollable growth of cells. A cancer diagnosis can have a substantial impact on mental health and wellbeing. According to National cancer institute (2024) <sup>[4]</sup> cancer is among the leading causes of death worldwide. In 2022, there were almost 20 million new cases and 9.7 million cancer-related deaths worldwide. According to estimated new cases in 2024, the most common cancers among men were prostate cancer, oral cancer, lung and bronchus cancer, colon and rectum cancer, bladder cancer and hepatic cancer. Among women most common cancers were breast cancer, endometrial cancer and cervical cancer, melanoma of the skin, leukaemia, thyroid cancer kidney and renal pelvis cancer. By 2040, the number of new cancer cases per year is expected to rise to 29.9 million and the number of cancer-related deaths to 15.3 million.

Research has shown that cancer patients often experience heightened levels of depression due to uncertainties about their diagnosis and treatment outcomes (Smith *et al.*, 2020) <sup>[5]</sup>. Depression commonly coexist among cancer patients, exacerbating emotional distress and impacting overall quality of life. This arise from the uncertainty of diagnosis,

treatment side effects, and the profound psychological impact of facing mortality. Addressing this condition is crucial for holistic cancer care, ensuring patients receive comprehensive support to cope with depression. The interplay between personal factors and depression in cancer patients is complex and can exacerbate the physical symptoms of the disease, affecting treatment adherence and recovery outcomes. Addressing these mental health issue is crucial not only for improving the patient's quality of life but also for optimizing their overall health and ability to cope with the challenges of cancer treatment. With this background, this study article investigates depression among cancer patients and its association with personal factors.

#### Materials and Methods

**Differential design:** A differential design method was employed to study the QoL and mental wellbeing of cancer patients of Dharwad and Hyderabad cities with selected factors.

#### Population and Sample

The present research was carried out in the Dharwad city of Karnataka State and Hyderabad city of Telangana State in the year 2022-23. A total of 150 cancer patients diagnosed

with three types of cancers (breast, gynecological and oral) were selected from 4 hospitals from Dharwad and Hyderabad cities through purposive sampling method.

### Tools used for the study

Self-structured questionnaire was used to collect personal information and Zigmond and Snaith's Hospital anxiety and depression tool was used to assess depression of cancer patients. The tool consists of 7 statements which are score on 4 point likert scale (0-3). The total scores are categorized

as normal (0-7), borderline abnormal (8-10) and abnormal (11-21). Higher the score indicates higher levels of depression among cancer patients.

### Statistical analysis of the data

Frequency and percentages were used. Chi square test was applied to find out the association between personal factors and depression.

### Results and Discussion

**Table 1:** Percentage distribution of cancer patients of Dharwad and Hyderabad according to personal characteristics

Individual factors	Category	Dharwad (n=75) n (%)	Hyderabad (n=75) n (%)
Age (years)	25-35	10 (13.33)	07 (09.33)
	36-46	15 (20.00)	11 (14.66)
	47-57	18 (24.00)	29 (38.66)
	>58	32 (42.67)	28 (37.34)
	Total	75 (100.00)	75 (100.00)
Gender	Male	18 (24.00)	10 (13.34)
	Female	57 (76.00)	65 (86.66)
	Total	75 (100.00)	75 (100.00)
Education	Professional qualification with technical degree or diplomas e.g. Doctor, Eng.CA, MBA. etc.	-	-
	Post graduation	-	-
	Graduation	05 (06.66)	08 (10.66)
	10th class pass but < graduation	12 (16.00)	09 (12.00)
	Primary pass but <10th	10 (13.34)	-
	< Primary pass but attended school for at least one year	12 (16.00)	23 (30.67)
	Just literate but no schooling	-	-
	Illiterate	36 (48.00)	35 (46.67)
Total	75 (100.00)	75 (100.00)	
Occupation	Service in central/State/Public undertakings or Owner of a company employing >20 persons or self employed professional viz Doctors, CAs, Eng. Etc	04 (05.34)	-
	Service in Private sector or independent business employing 2-20 persons	05 (06.66)	10 (13.34)
	Service at shops, home, transport, own cultivation of land	16 (21.33)	-
	Self-employed e.g. shops, Rehdiies or petty business with income >5000	-	20 (26.66)
	Self-employed with income < 5000 (laborer, house wife)	50 (66.67)	45 (60.00)
	None of the family member is employed	-	-
Total	75(100.00)	75(100.00)	
Depression	Normal	40 (53.33)	18 (24.00)
	Borderline Abnormal	27 (36.00)	22 (29.33)
	Abnormal	08 (10.67)	35 (46.67)
	Total	75 (100.00)	75 (100.00)

Figures in parenthesis indicate percentages

Table 1 shows the frequency distribution of Dharwad and Hyderabad cancer patients according to personal characteristics such as age, gender, education, occupation. With regard to age of the patients in Dharwad, results showed that 42.67 percent of them were in the age group of  $\geq 58$  years, 24.00 percent were in 47-57 years, 20.00 percent were in 36-46 years and 13.33 percent were in 25-35 years of age group. With regard to Hyderabad, 38.66 percent of them were aged between 47-57 years, 37.34 percent were in  $\geq 58$  years, 14.66 percent were in 36-46 years and remaining 09.33 percent were in age group of 25-36 years. With respect to gender in Dharwad, results shows that majority (76.00%) were females and 24.00 percent were males. In Hyderabad also majority (86.66%) were females and 13.34

percent were males.

Results with respect to the educational background of patients in Dharwad, results showed that nearly half of them (48.00%) were illiterates, followed by equal percent (16.00%) were 10<sup>th</sup> class passed but had <graduation and were < primary passed but attended school for at least one year, 13.34 percent were primary passed but < 10<sup>th</sup> passed and only 06.66 percent had graduation. With regard to Hyderabad also nearly half of them (46.67%) were illiterates, followed by 30.67 percent were < primary passed but attended school for at least one year. Furthermore, 12.00 percent were 10<sup>th</sup> class passed but <graduated and 10.66 percent had graduation. Results related to occupation in Dharwad, showed that majority (66.67%) were self-

employed with income < 5000 (laborer, house wife), followed by 21.33 percent were doing service at shops, home, transport, own cultivation of land and 06.66 percent were involved in Private sector or independent business employing 2-20 persons. Results with regard to Hyderabad, showed that majority (60.00%) were self-employed with income < 5000 (laborer, house wife), followed by 26.66 percent were self-employed e.g. shops, Remedies or petty business with income >5000 and 13.34 percent were involved in Private sector or independent business

employing 2-20 persons.

With regard to distribution of patients with depression, in case of Dharwad, results showed that, more than half of them (53.33%) were in category of normal depression and 36.00 percent were in category of borderline abnormal depression and 10.67 percent were in category of abnormal depression. Among patients of Hyderabad, 46.67 percent were in category of abnormal depression, followed by 29.33 percent were in category of borderline abnormal and 24.00 percent were in normal depression category.

**Table 2:** Association between depression of Dharwad and Hyderabad cancer patients with age

Age (in years)	Depression									
	Normal (40)	Borderline abnormal (27)	Abnormal (08)	Total (75)	Modified $\chi^2$	Normal (18)	Borderline abnormal (22)	Abnormal (35)	Total (75)	Modified $\chi^2$
25-35	06 (60.00)	03 (30.00)	01 (10.00)	10 (100.00)	4.18 <sup>NS</sup>	04 (57.10)	02 (28.60)	01 (14.30)	07 (100.00)	13.61 <sup>**</sup>
36-46	09 (60.00)	05 (33.30)	01 (06.70)	15 (100.00)		02 (18.20)	06 (54.50)	03 (27.30)	11 (100.00)	
47-57	12 (66.70)	05 (27.80)	01 (05.60)	18 (100.00)		08 (27.60)	09 (31.00)	12 (41.40)	29 (100.00)	
≥58	13 (40.60)	14 (43.80)	05 (15.60)	32 (100.00)		04 (14.30)	05 (17.90)	19 (67.90)	28 (100.00)	

Results from table 2 reveals the association between depression of Dharwad and Hyderabad cancer patients and age. In case of Dharwad patients, equal percent (60.00%) of the patients in 25-35 years and 36-46 years of age were in normal depression category. Among 47-57 years of age group, 66.70 percent were in normal category whereas 43.80 percent of the patients in ≥ 58 years were in borderline abnormal depression category. Chi square analysis highlights non-significant association between depression and age of the patients. With reference to Hyderabad, 57.10 percent of the patients in 25-35 years were in normal

depression category and 54.50 percent of the patients in 36-46 years were in borderline abnormal depression category. Among 47-57 years and ≥58 years, 41.40 percent and 67.90 percent were in the category of abnormal depression respectively. On analysis a significant association was found between depression (13.61\*\*) and age of patients. Ayalew *et al.* (2021) [1] also reported significant association of age with depression of cancer patients. Older patients (>50 years) were two times more likely to be affected by depression than younger age groups.

**Table 3:** Association between depression of Dharwad and Hyderabad cancer patients with gender

Gender	Depression									
	Normal (40)	Borderline abnormal (27)	Abnormal (08)	Total (75)	$\chi^2$ Value	Normal (18)	Borderline abnormal (22)	Abnormal (35)	Total (75)	$\chi^2$ Value
Women	29 (50.90)	22 (38.60)	06 (10.50)	57 (100.00)	0.71 <sup>NS</sup>	16 (24.60)	15 (23.10)	34 (52.30)	65 (100.00)	9.90 <sup>**</sup>
Men	11 (61.10)	05 (27.80)	02 (11.10)	18 (100.00)		02 (20.00)	07 (70.00)	01 (10.00)	10 (100.00)	

Results from table 3 reveals the association between depression of Dharwad and Hyderabad cancer patients and gender. Results related to depression, in Dharwad, it was observed that, 61.10 percent of men were in the normal category. Around 50.90 percent of women were in the normal category. Chi square value highlights non-significant association between depression of patients and gender. With reference to Hyderabad, 52.30 percent of women were in the category of abnormal depression while 70.00 percent of men

were in the category of borderline abnormal depression. On analysis a significant association was found between depression (9.90\*\*) and gender of the patients. Similar results were found in a study conducted by Linden *et al.* (2012) [3] reported higher rates depression among women compared to men. This was justified by the fact of body image issues, hormonal changes and double burden of care giving responsibilities for women made them more depressed than men.

**Table 4:** Association between depression of Dharwad and Hyderabad cancer patients with education

Education	Depression									
	Normal (40)	Borderline abnormal (27)	Abnormal (08)	Total (75)	Modified $\chi^2$	Normal (18)	Borderline abnormal (22)	Abnormal (35)	Total (75)	Modified $\chi^2$
Graduation	03 (60.00)	03 (20.00)	01 (20.00)	05 (100.00)	8.67 <sup>N</sup> S	05 (62.50)	02 (25.00)	01 (12.50)	08 (100.00)	27.72 <sup>**</sup>
10 <sup>th</sup> pass but < graduation	07 (58.30)	04 (33.30)	01 (08.30)	12 (100.00)		01 (11.10)	06 (66.70)	02 (22.20)	09 (100.00)	
Secondary	02 (20.00)	07 (70.00)	01 (10.00)	10 (100.00)		-	-	-	-	
Primary	05 (41.70)	05 (41.70)	02 (16.70)	12 (100.00)		08 (34.80)	09 (39.10)	06 (26.10)	23 (100.00)	
Illiterate	23 (63.90)	10 (27.80)	03 (08.30)	36 (100.00)		04 (11.40)	05 (14.30)	26 (74.30)	35 (100.00)	

Results from table 4 reveals the association between depression of Dharwad and Hyderabad cancer patients and

education. In Dharwad, it was observed that 60.00 percent of the patients with graduation and 58.30 percent of the

patients with 10<sup>th</sup> grade passed but less than graduation were in the category of normal depression. Majority (70.00%) of the patients with secondary education were in the category of borderline abnormal. depression whereas equal percent (41.70%) of the patients with primary education were in the category of normal and borderline depression. Furthermore majority (63.90%) of illiterates were in the category of normal depression. On analysis non-significant association was found between depression of patients and education. With reference to Hyderabad, 62.50 percent of graduates were in the normal category. Among the patients who

completed 10<sup>th</sup> grade but less than graduation and primary education, 66.70 percent and 39.10 percent were in the category of borderline abnormal depression while majority (74.30%) of illiterates were in the category of abnormal depression. Chi square analysis revealed significant association between depression (27.72\*\*) and education of the patients. Results were also in line with the study conducted by Helalah *et al.* (2014) [2] reported a significant association of educational status with depression of cancer patients. Those with no formal education had more anxiety and depression levels.

**Table 5:** Association between depression of Dharwad and Hyderabad cancer patients with occupation

Occupation	Depression				Modified $\chi^2$	Normal (18)	Borderline abnormal (22)	Abnormal (35)	Total (75)	Modified $\chi^2$
	Normal (40)	Borderline abnormal (27)	Abnormal (08)	Total (75)						
Central/State government job	02 (50.00)	01 (25.00)	01 (25.00)	04 (100.00)	9.74 <sup>NS</sup>	-	-	-	-	12.79*
Private job/Business	04 (80.00)	-	01 (20.00)	05 (100.00)		05 (50.00)	04 (40.00)	01 (10.00)	10 (100.00)	
Service at shop/own cultivation	06 (37.50)	10 (62.50)	-	16 (100.00)		06 (30.00)	08 (40.00)	06 (30.00)	20 (100.00)	
Self employed < 5k	28 (56.00)	16 (32.00)	06 (12.00)	50 (100.00)		07 (15.60)	10 (22.20)	28 (62.20)	45 (100.00)	

Results from table 5 reveals the association between depression of Dharwad and Hyderabad cancer patients and occupation. Results related to depression, In Dharwad, it was observed that, about 80.00 percent of the patients involved either in private job or business were in the category of normal depression. Among the patients who are doing service at shops or involved in own cultivation, 62.50 percent were in the normal category. On analysis significant association was found between the depression and occupation of the patients. With regard to Hyderabad, about 50.00 percent of the patients involved either in private job or business were in the category of normal depression. Among the patients who are doing service at shops or involved in own cultivation and who are self-employed with income <5000, 40.00 percent and 62.20 percent were in the category of borderline abnormal and abnormal depression respectively. Chi square value also revealed a significant association between the depression (12.79\*\*) and occupation of the patients. A study conducted by Yen *et al.* (2016) [6] also reported that those who had office jobs had the lowest levels of depression than those who were laborers and those involved in farming activity.

**Conclusion and Implications**

The study highlights the significant influence of personal factors such as age, gender, education and occupation on depression of cancer patients. It was shown that cancer patients with advanced age, women patients, and patients with poor educational and occupational status had abnormal depression levels. So interventions should be tailored to their specific circumstances and preferences. A holistic approach with inclusion of individual counselling sessions, group therapy sessions that addresses physical, psychological, social aspects of care is most effective in reducing depression among the patients.

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