



DEPRESSION, ANXIETY AND PSYCHOLOGICAL STRESS AMONG CANCER PATIENTS ON TREATMENT IN NEPAL

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ARTICLE INFO

Article History:

Received 9th February, 2018

Received in revised form 26th

March, 2018 Accepted 17th April, 2018

Published online 28th May, 2018

Key words:

Anxiety, Cancer, Depression, Perceived Stress, Psychological Stress, Social Support

ABSTRACT

Background: Cancer is a stressful life event when a person is diagnosed with it. Depression and anxiety are the most common manifestations of cancer patients. It has been estimated that for every 10 cancer patients 2 are depressed. The aim of this cross-sectional study is to assess the level of depression, anxiety and psychological stress among cancer patients undergoing treatment and find their determinants.

Materials and methods: It was conducted at Bhaktapur Cancer Hospital, Nepal. Respondents were interviewed using structured questionnaires to collect information on depression, anxiety, perceived stress and social support. Descriptive statistics, Chi Square or Likelihood Ratio test were used to find the determinants. Statistical analysis was done by using SPSS version 16.

Results: For this study, 309 cancer respondents were identified. Of these, 49.2% reported moderate to severe depression, 26.5% with moderate anxiety to potential cause of concern and 75.7% had moderate to high perceived stress. The key determinants identified were age, gender, marital status, education, stages of cancer and system of cancer.

Conclusion: The study showed that depression and perceived stress were common among cancer cases than anxiety.

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INTRODUCTION

Cancer is the second leading cause of death globally. There were 8.8 million deaths worldwide in 2015 and the most common deaths were from lung (36.92%), liver (17.22%), colorectal (16.91%), stomach (16.47%) and breast (12.48%) (WHO, 2015). In Nepal, the total deaths accounted for 186,000 in both males and females in 2014. The most common deaths in females were from cervix uteri (18.4%), trachea, bronchus and lung(14.3%), breast(11.6%), ovary(7%), stomach(5.7%) and others(42.9%) (WHO,2014). Cancer diagnosis and its treatment may cause stressful experiences in all the cancer cases and stress is often a triggering factor for cancer distress (Linstrom T et al.2013).

The exact prevalence of depression and anxiety among cancer patients often remains unclear. A review on 211 studies among cancer patients, in different contexts and stages reported that the prevalence of depression ranged from 8-24% and it differed by type of cancer and treatment phase (Krebbler AMH et al.2014).

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Studies had reported that young adults and women had high levels of anxiety and depression (Cordes MC et al.2014). The causes of depression identified were emotional impact of a cancer diagnosis, side effects of treatment, progression of disease with associated disability, disruption of key relationship, dependence, disability, disfigurement and approaching death (Nikbakhsh N et al.2014).

Studies from Nepal were limited in addressing prevalence and etiology of depression, anxiety and psychological stress. Hence, this study was conducted to assess the level of depression, anxiety and psychological stress among cancer patients undergoing treatment and to find its key determinants.

METHODS

This facility based cross-sectional study was conducted among 309 cancer patients undergoing treatment in Bhaktapur Cancer Hospital, Nepal over a period of four months between January and April 2018. The questionnaire consists of socio-demographic and Clinical characteristics, scales like Beck Depression Inventory (BDI-II), Beck Anxiety Inventory (BAI), Perceived Stress Scale (PSS-10), Multidimensional Scale of Perceived Social Support (MSPSS) for assessing depression, anxiety, perceived stress and social support.

Ethical clearance was obtained from Institutional Ethics Committee of University and formal approval from Bhaktapur Cancer Hospital was also taken. Informed consent was taken from the participants. The participants under 18 years of age, on concurrent psychiatric disorder treatment, post-operative care unit within 7 days after surgery and benign tumor were excluded. Data were analyzed using SPSS version 16. Chi Square or Likelihood Ratio test were used to find association between characteristics and the level of depression, anxiety and perceived stress and Spearman's rho to find the relationship between depression, anxiety, perceived stress and social support.

RESULTS

Of the 309 participants, 212(68.6%) are females, the age of the respondents ranged between 18-85 years with mean age of 53.04±14.22 years and majority (31.7%) in the age group of 51-60 years. Majority 225(72.8%) were residing in rural area.

Secondary	10(13.33)	36(24.83)	6(6.74)
Higher secondary and above	5(6.67)	12(8.28)	1(1.12)

*Chi Square test value **Likelihood ratio value

Among the respondents, 81.2% were married and 33.7% had non-formal education. About 52.1% of respondents were in Stage I cancer and it was observed that majority (45%) had reproductive system of cancer (breast, cervix, uterus, ovary, vulva and prostate). Majority (28.8%) had moderate level of depression followed by mild (26.9%), minimal (23.9%), and severe (20.4%). Regarding anxiety, 73.5% had low level of anxiety followed by 23.3% with moderate and 3.2% with potential cause for concern and in perceived stress, 24.3% had low, 46.9% had moderate and 28.8% had high perceived stress.

There was an association between age, gender, marital status, stages of cancer and system of cancer with level of depression and were statistically significant (p<0.05).

Table 1 Association between socio-demographic characteristics with level of depression and anxiety

Characteristic (n=309)	Level of depression				Test value (p value)	Level of anxiety			Test value (P value)
	Minimal (0-13) n(%)	Mild (14-19) n(%)	Moderate (20-28) n(%)	Severe (29-63) n(%)		Very low (0-21) n(%)	Moderate (22-35) n(%)	Potential cause for concern (35+)n(%)	
Gender									
Male	17(22.97)	35(42.2)	23(25.84)	22(34.9)	8.54* (0.04)	74(32.6)	19(26.39)	4(40)	1.33* (0.51)
Female	57(77.03)	48(57.8)	66(74.16)	41(65.1)		153(67)	53(71.62)	6(60)	
Age (years)									
<20	1(1.35)	6(7.23)	0	1(1.59)	39.7** (0.008)	5(2.20)	2(2.77)	1(10)	23.8** (0.02)
21-30	4(5.41)	5(6.02)	5(5.62)	4(6.35)		10(4.41)	8(11.1)	0	
31-40	6(8.11)	5(6.02)	9(10.11)	7(11.11)		21(9.25)	6(8.33)	0	
41-50	16(21.62)	20(24.1)	16(17.97)	19(30.2)		58(25.6)	11(15.28)	2(20)	
51-60	21(28.38)	21(25.3)	39(43.82)	17(27)		73(32.2)	24(33.3)	1(10)	
61-70	17(22.97)	13(15.7)	13(14.60)	13(20.6)		34(15)	16(22.2)	6(60)	
>70	9(3.16)	13(15.7)	7(7.87)	2(3.17)		26(11.5)	5(6.94)	0	
Place of residence									
Rural	50(67.57)	63(75.9)	71(79.78)	41(65.1)	5.51* (0.13)	165(73)	54(75)	6(60)	1.05** (0.61)
Urban	24(32.43)	20(24.1)	18(20.22)	22(34.9)		62(27.3)	18(25)	4(40)	
Marital status									
Married	64(86.8)	59(71.1)	72(80.89)	56(67.5)	36.6** (<0.001)	192(85)	50(69.44)	9(90)	15.9** (0.01)
Unmarried	5(6.76)	12(14.5)	2(2.25)	2(3.17)		11(4.85)	10(13.9)	0	
Divorced	1(1.35)	0	0	4(6.34)		1(0.44)	4(5.56)	0	
Widowed	4(5.41)	12(14.5)	15(16.85)	1(1.59)		23(10.1)	8(11.11)	1(10)	
Education status									
Illiterate	27(36.49)	25(30.1)	30(33.7)	18(28.6)	19.52* (0.07)	70(30.8)	26(36.1)	4(40)	9.48** (0.49)
Non-formal	21(28.38)	23(27.7)	35(39.3)	25(39.7)		16(7.05)	8(11.11)	1(10)	
Primary	3(4.05)	11(13.3)	5(5.62)	6(9.52)		16(7.05)	8(11.11)	1(10)	
Secondary	15(20.27)	11(13.3)	13(14.60)	13(20.6)		44(19.4)	7(9.72)	1(10)	
Higher secondary and above	8(10.8)	13(15.7)	6(6.74)	1(1.58)		12(5.29)	6(8.33)	0	

*Chi Square test value **Likelihood ratio value

Table 2 Association between socio-demographic characteristics and level of perceived stress

Characteristics	Level of perceived stress			Test value	P value
	Low (0-13)n(%)	Moderate (14-26)n(%)	High perceived stress (27-40)n(%)		
Gender(n=309)					
Male	19(25.33)	48(33.10)	30(33.71)	1.69*	0.41
Female	56(74.67)	97(66.90)	59(66.29)		
Age (years)(n=309)					
<20	1(1.33)	6(4.14)	1(1.12)	17.83**	0.21
21-30	1(1.33)	9(6.21)	8(8.98)		
31-40	7(9.33)	11(7.59)	9(10.11)		
41-50	13(17.33)	42(28.97)	16(17.98)		
51-60	28(37.33)	39(26.90)	31(34.83)		
61-70	16(21.33)	23(15.86)	17(19.10)		
>70	9(12)	15(10.34)	7(7.86)		
Place of residence(n=309)					
Rural	54(72)	110(75.86)	61(68.54)	1.52**	0.46
Urban	21(28)	35(24.14)	28(31.46)		
Marital status (n=309)					
Married	67(89.33)	112(77.24)	72(80.89)	19.61**	0.003
Unmarried	4(5.33)	15(10.34)	2(2.25)		
Divorced	1(1.33)	0	4(4.49)		
Widowed	3(4)	18(12.41)	11(12.36)		
Education status(n=309)					
Illiterate	26(34.67)	39(26.90)	35(39.33)	32.34**	<0.001
Non-formal	28(37.33)	43(29.66)	33(37.08)		
Primary	3(4)	14(9.66)	8(8.99)		

Whereas education level and place of residence were not found statistically significant. There was an association between age and marital status with level of anxiety and also was statistically significant (p<0.05). Whereas association between gender, education level, place of residence, stages of cancer and system of cancer were not statistically significant (Table 1 and 3)

There was an association between marital status, education level, stages of cancer and system of cancer (p<0.001) with the level of perceived stress and was also statistically significant (p<0.05). (Table 2 and 4) Social support was negatively correlated with depression (ρ=-0.34, p<0.001), anxiety (ρ=-0.30, p<0.001), and perceived stress (ρ=-0.43, p<0.001).

al. (2014) and Mushtaq et al. (2017) didn't find association between gender and level of depression.

Table 3 Association between clinical characteristics with level of depression and anxiety

Characteristic (n=309)	Level of depression				Test value (p value)	Level of anxiety			
	Minimal (0-13)n(%)	Mild (14-19) n(%)	Moderate (20-28) n(%)	Severe (29-63) n(%)		Very low (0-21) n(%)	Moderate (22-35) n(%)	Potential cause for concern (35+)n(%)	Test value (p value)
Stages of cancer									
I	45(60.81)	50(60.3)	43(48.3)	23(36.5)	22.2* (0.008)	117(51.54)	39(54.17)	5(50)	3.50** (0.73)
II	15(20.27)	23(27.7)	29(32.5)	27(42.9)		67(29.51)	23(31.94)	4(40)	
III	7(9.46)	9(10.84)	8(8.98)	0		21(9.25)	6(8.33)	0	
IV	7(9.46)	1(1.20)	9(10.11)	10(15.9)		22(9.69)	4(5.56)	1(10)	
System of cancer									
Reproductive	44(10)	31(22.3)	38(27.3)	26(41.3)	32.8** (<0.001)	104(74.8)	31(22.30)	4(2.87)	9.28** (0.3)
Respiratory	7(19.44)	4(11.11)	15(41.7)	10(27.8)		24(66.6)	10(27.7)	2(5.56)	
Urinary	8(18.18)	14(31.8)	14(31.8)	8(18.18)		33(75)	9(20.45)	2(4.54)	
Digestive	0	6(54.54)	0	5(45.45)		11(100)	0	0	
Others	15(18.98)	28(35.5)	22(27.8)	14(17.7)		55(69.62)	22(27.84)	22(27.9)	

*Chi Square test value **Likelihood ratio value

Table No. 4 Association between clinical characteristics and level of perceived stress

Characteristics	Level of perceived stress			Test value	P value
	Low (0-13)n(%)	Moderate (14-26)n(%)	High perceived stress (27-40)n(%)		
Stages of cancer(n=309)					
I	46(61.33)	85(58.62)	30(33.71)	38.27** Likelihood ratio	<0.001
II	16(21.33)	50(34.48)	28(31.46)		
III	9(12)	3(2.06)	15(16.85)		
IV	4(5.33)	7(4.82)	16(17.97)		
System of cancer(n=309)					
Reproductive	43(30.93)	55(39.56)	41(29.49)	18.43* Chi square test	0.01
Respiratory	6(16.67)	19(52.77)	11(30.55)		
Urinary	9(20.45)	29(65.9)	6(13.63)		
Digestive	0	8(72.72)	3(27.27)		
Others	17(21.5)	34(87.17)	28(35.44)		

*Chi Square test value **Likelihood ratio value

DISCUSSION

In the present study, about 49.2% had depression, 26.5% had anxiety, and 24.4% had comorbidity (depression and anxiety). Abuelgasim A et al. (2016) reported prevalence of anxiety (22.3%), depression (46.5%), and comorbidity (38%). This suggests that high rates of anxiety and depression is a common among cancer patients.

About 33.6% of cancer patients experienced psychological stress in Korea (Kim G et al.2017). Whereas in this study, 75.5% had perceived stress, which was more than two-fold higher than in Korea. Thus, perceived stress varies across populations.

Kumar R et al. (2016) evidenced prevalence of depression was 22% and anxiety was 31.7%, Nikbakhsh et al. (2014) also reported for same pattern as 48% and 46%⁶, Hong JS et al.(2014) found 66.72% depression rate and 64.2% by Sharma et al.(2015) in Nepal. In general population of Nepal, the prevalence of depression and anxiety was 11.7% and 22.7% (Risel et al.2016). Thus, prevalence of depression was nearly four-fold higher among cancer patients and it is important to have psychometric assessments in cancer hospitals.

In current study, females are severely depressed. The similar finding was consistent with the results of Hong et al. (2014), Bergerot et al. (2017), Blazquez et al. (2016) and Walker et al. (2014). This may be due to greater emotional, physical and family problems perceived by females. However, Nikbakhsh et

The findings shows that 41-50 years of age group respondents are severely depressed and there was an association between age and depression (p=0.008). Hence, middle-aged cancer patients are at higher risk of depression and anxiety owing to their vulnerability to productivity loss, diminished coping mechanisms for physical, social and mental disability caused due to cancer morbidity.

In the present study, married respondents were found severely depressed. The similar finding was observed in Eomet al. (2012) and Goncalves et al. (2008).Although married respondents are supposed socially secure, it does not contribute in alleviating depression.

The results revealed no association between education status and level of depression. Whereas Hong JS et al. (2014), Sharma A et al. (2015), Bjelland et al. (2008) and Berihun F et al. (2017) found respondents with lower education were severely depressed. However, Nikbakhsh et al. (2014) didn't find any association. It can be justified that higher level of education are less proven to depression as education contributes to better quality of life.

In this study, moderate depression and perceived stress was greater in stage I. Mushtaq et al. (2014) found depression was high among stage III. Whereas Berihun et al. (2017) found no association with depression and anxiety. The results showed that the perceived stress was positively correlated with depression (ρ=0.69, p<0.001) and anxiety (ρ=0.546, p<0.001). Kang D et al. (2012) and Harlt K et al. (2010) observed the similar findings. Social support was found negatively correlated with perceived stress (ρ=-0.43, p<0.001). Hong JS et al. (2014) and Berhili S et al. (2016) supported this finding.

CONCLUSION

Depression and perceived stress were common among cancer patients and it could be due to severity, chronicity, and poor prognosis of the disease and also due to prolonged treatment. Nearly one fourth of the respondents had depression and anxiety as comorbidity. Despite the respondents' perceived social support being high, nearly half of the respondents were diagnosed for various levels of depression. Hence, depression is independent of social support. Thus, use of psychometric

scales enhances the rate of identification of common mental disorders among cancer patients.

Acknowledgement

Authors would like to express sincere gratitude to Bhaktapur Cancer Hospital for providing an opportunity to conduct this study.

Conflict of interest

The authors declare that there is no conflict of interest.

Source of funding

Nil

References

1. Abuelgasim KA, Ahmed GY and Malik MA. Depression and anxiety in patients with hematological malignancies, prevalence, and associated factors. *Saudi Medical Journal*.2016; Vol. 37 (8): 877-881;DOI:10.15537/smj.2016.8.14597
2. Bergerot CD, Mitchell H, Ashing KT and Kim Y. A prospective study of changes in anxiety, depression, and problems in living during chemotherapy treatments: effects of age and gender. *Support Care Cancer* 2017; 25:1897–1904. DOI:10.1007/s00520-017-3596-9
3. Berhili S, Kadiri S, Bouziane A, Aissa A, Marnouche E, Ogandaga E *et al.* Associated factors with psychological distress in Moroccan breast cancer. *Epub* 2016; 31: 26-33
4. Berihun F, Haile S, AbawaM, Mulatie and Shimeka A . Prevalence and correlates of anxiety and depression among cancer patients in the university of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia. *Archives Depression and Anxiety* 2017;3(2): 042-048
5. Blazquez, Cruzado. A longitudinal study on anxiety, depressive and adjustment disorder, suicidal ideation and symptoms of emotional distress in patients with cancer undergoing radiotherapy. *Journal of psychosomatic research*. 2016;87;14-21
6. Bjelland I, KrokstadS, Mykletun A, Dahl AA, Tell GS, Tambs K, *et al.* Does a higher educational level protect against anxiety and depression? *The hunt study. Social Science and Medicine* 2008; 66(6):1334-45
7. Cordes MC, Scherwath A, Steinmann D, Ahmad T, Cole AM, Ernst G, *et al.* Distress, anxiety and depression in patients with brain metastases before and after radiotherapy. *BioMedCentral Cancer* 2014, 14:731.DOI:10.1186/1471-2407/14/731
8. Eom CS, Shin DW, Kim SY, Yang HK, Jo HS, Kweon SS *et al.* Impact of perceived social support on the mental health and health related quality of life in cancer patients: results from the nationwide, multicenter survey in South Korea. *Psychooncology* 2013; 22(6): 1283-90. DOI: 10.1002/pon.3133.
9. Goncalves V, G Jayson, Tarrier N. A longitudinal investigation of psychological morbidity in patients with ovarian cancer. *British Journal Cancer* 2008; 99(11): 1794-801. DOI: 10.1038/sj.bjc.6604770.
10. Harlt K, Engel J, Herschbach P, Reinecker H, Sommer H, Friese K, Personality trait and psychosocial stress and quality of life after 2 years following breast cancer diagnosis and psychological impact factors. *Psychooncology* 2010; 19(2):160-169
11. Hong JS, Tian J. Prevalence of anxiety and depression and their risk factors in Chinese cancer patients. *Support Care Cancer*.2014;22(2):453- 9, DOI:10.1007/s00520-013-1997-y
12. Kang DH, Park NJ, McArdle. Cancer specific stress and mood disturbance: Implications for symptom perception, quality of life, and immune response in women shortly after diagnosis of breast cancer. *Internationally Scholarly Research Network*. 2012;DOI:10.5402/2012/608039
13. Kim GM, Kim SJ, Song Sk, Kim HR, Kang BD, Noh SH *et al.* Prevalence and prognostic implications of psychological distress in patients with gastric cancer. *BioMedCentral Cancer*.2017;17:283
14. Kumar R, Singh KK, Rae AA, Singh RK, Singh GR. Prevalence of anxiety and depression among cancer patients. *Journal of Medical Science And clinical Research* 2016;2; 2455-0450
15. Krebber AMH, Buffart LM, Klejin G, Reipma IC, Bree RD, Leemans CR *et al.* Prevalence of depression in cancer patients: a meta-analysis of diagnostic interviews and self-report instruments. *Psychooncology* 2014;23 (2):121-130
16. Lindstrom T, A. Screening and assessment of distress, anxiety and depression in cancer patients. *DigitalaVetenskapligaArkivet*. 2014. ISBN 978-91554-8965-6
17. Mushtaq R, Ansar A, BiBi Anwar, Khurram H, AliJazib, Islam Ayesha *et al.* Frequency of depression among cancer patients. *Annals of Pakistan Institute of Medical Science* 2017;13(1):83-87
18. Nibkakhsh N, Moudi S, Abbasian S, Khafri S. Prevalence of depression and anxiety among cancer patients. *Caspian Journal of Internal Medicine* 2014; 5(3): 167-170
19. Risal A, Mananghar K, Holen A. Anxiety and depression in Nepal: Prevalence, comorbidity and associations. *Bio Med Central Psychiatry* 2016; 16:102
20. Sharma A, Zhang J. Depression and its predictors among breast cancer patients in Nepal. *ASEAN Journal of Psychiatry* 2015; Vol.16(1)
21. Walker J, Hansen CH, Martin P, Symeonides S, Ramessur R, Murray G *et al.* Prevalence , associations, and adequacy of treatment of major depression in patients with cancer: a cross sectional analysis of routinely collected clinical data. *Lancet Psychiatry* 2014;1: 343-350
22. World Health Organization. *Cancer factsheet*, 2015 [internet]. Available from: www.who.int/mediacentre/factsheet/fs297/en
23. World Health Organization. *Cancer Country Profile*, 2014. Available from: www.who.int/cancer/country-profiles/en/
