



ANXIETY AND DEPRESSION AMONG KIDNEY AND URINARY BLADDER CANCER PATIENTS UNDERGOING SURGERY.

Public Health

**Richha
Prabhakar***

Research Scholar, Department of Public Health, Poornima University, Jaipur.
*Corresponding Author

**Dr. Rajat
Prabhakar**

SR Urology, Department of Urology, Research And Referral Hospital, New Delhi.

**Dr. Dharmapuri
Raghunatha Rao**

Professor, Department of Public Health, Poornima University, Jaipur.

ABSTRACT

Cancer is a Life threatening disease that can take an emotional and psychological toll on patients. As cancer patients cope with the physical and emotional effects of their disease, they may experience anxiety, depression, or other mental health problems. This study aimed to assess the levels of anxiety and depression in patients with bladder and renal cancer following surgery. A cross-sectional study was conducted in the urology department of a tertiary care hospital in New Delhi. A standardised anxiety and depression questionnaire was filled by participants to assess the severity of their symptoms. A sample of 100 post-surgery cancer patients in total (50 with bladder cancer and 50 with renal cancer) took part in the study. According to the findings, both bladder and renal cancer patients who underwent surgery reported higher than usual levels of anxiety and sadness. However, the data analysis showed that renal cancer patients experienced significantly more anxiety and depression than those with bladder cancer. These findings emphasise the value of psychological interventions and support for these cancer patients who may be more prone to suffering from distressing psychological symptoms. By implementing focused mental health programs and counselling services, it may be possible to lessen the burden of anxiety and depression in these patients, improving their general well-being and quality of life throughout their cancer journey. Further investigation is required to determine the underlying causes of the differences in anxiety and depression between bladder and renal cancer patients and to provide tailor made strategies for psychological support.

KEYWORDS

Anxiety, Depression, Cancer, Urinary Bladder, Renal Cancer, Hospital anxiety and depression scale (HADS)

INTRODUCTION

Cancer is a Non- Communicable Disease (NCD) is of public health concern causing severe, mental health issues like anxiety and depression among those patients suffering from this chronic illness. As cancer patients cope with the physical and emotional effects of their disease, they may experience anxiety, depression, or other mental health problems during this life threatening experience. According to projections, there will be over 11 million cancer-related deaths worldwide by 2030 (1,2,3). Amongst urinary tract cancers, kidney and bladder cancers are the malignancies associated with worst outcomes. According to epidemiological data, Kidney cancer (RCC – renal cell carcinoma) is found to be one of the top ten most common cancers worldwide. It is the sixth most common cancer in men and tenth most common cancer in women (4). Worldwide, bladder cancer (BC) is the 10th most prevalent cancer, being 6th most common among males and 17th among females (5). In USA, it is the sixth most prevalent cancer (6). Cooke et al, revealed that anxiety and depression were increased in frequency with increasing levels of treatment rigour. Their results suggested that women were more likely to experience anxiety and depression than men (7).

Depression and anxiety are the two most common types of psychiatric illnesses observed in cancer patients and their prevalence and severity vary according to the type and stage of cancer. These can have a major impact on cancer treatment and outcomes. As a person's quality of life (QoL) declines, their ability to recover from sickness may take longer, and their survival is jeopardised. Evaluation and treatment of malignancies require a multimodality treatment and a great effort goes into the same, by both the healthcare provider and the patients including the caregivers. However, most of the times, treatment of physical disorders take precedence and mental health usually takes a backseat, rather it is not even taken into account when discussing treatment plans. Patients with malignancies have a much higher risk of anxiety and depression than the general population. Treatment adherence for cancer patients may suffer if the patient's mental requirements are not satisfied. (8,9)

Various international studies show that between 12% and 40% of all cancer patients suffer from some form of anxiety or depression (10,11). According to a study conducted in India, Cancer patients experience significant rate of anxiety (40.9%) and depression (42.6%) (12). In China, the prevalence of depression (54.90%) and anxiety (49.69%) in cancer patients is higher than in normal adults (depression: 17.50%,

Anxiety:18.37%)(13).

Diagnosis of any cancer and its treatment gives a jolt to the Patient's health. In addition to this, bladder cancer and RCC patients experience noticeable differences in their psychological and social conditions. Their treatment most commonly involves surgery, which often involves TURBT (transurethral resection of bladder tumour) or cystectomy (removal of the urinary bladder) followed by urinary diversion/ reconstruction in BC and removal of kidney i.e. radical nephrectomy in RCC patients. The permanent need to wear a urostomy bag or using artificial bladder throughout life following cystectomy may cause tremendous stress to the patients in terms of their physiology, psychology, and social interactions. In Non muscle invasive bladder cancer (Stage I) patients, surveillance schedule requires multiple visits to hospitals and intravesical therapy in many patients. In RCC patients, removal of kidney entails life long follow up and the increased risk of progressing into chronic kidney disease (CKD) necessitating the requirement of dialysis. Increasing levels of treatment rigour cause an increased frequency of anxiety and depression (14).

Many studies have linked RCC and BC diagnosis with psychological problems like stress, anxiety and depression (15,16). According to SEER (Surveillance, Epidemiology, and End Results) database analysis from 1988–2010, both genders are associated with higher risks of anxiety, depression and suicide in BC and RCC. (17)

Patients with BC and RCC experience many symptoms including pain, fatigue, physical inactivity, long recovery illness, difficulty in managing symptoms, nonadherence to treatment, short survival time and sexual/urinary changes (18,19). All these factors can lead to mental health problems such as depression, anxiety, helplessness, insomnia, loneliness and post traumatic stress disorder (PTSD), which are common mental health problems in cancer patients (20,21). Therefore, regular examination and appropriate management of these psychiatric disorders should be an important part of oncological treatment in cancer patients.

However, there are few studies on the evaluation of depression, anxiety, and post-traumatic stress disorder in urinary bladder and renal cancer patients (22-28). By implementing focused mental health programmes and counselling services, it may be possible to lessen the burden of anxiety and depression in this patient population, improving their general wellbeing and QoL throughout their cancer journey (29–32).

In light of the aforementioned concerns, this paper investigates 1) A assessment of depression and anxiety symptoms in Indian patients with renal and urinary bladder cancer and 2) Comparison of anxiety, depression scores with respect to different sociodemographic variables in both populations.

MATERIALS AND METHODS

A cross sectional study was conducted in which all participants were recruited from the Urology Department of a tertiary care hospital in New Delhi. Data collection was in accordance with the ethical guidelines of the concerned institute. Written informed consent was obtained from all participants regarding the conduct of the study. We protected the privacy of individuals when processing personal information and kept personal information confidential.

The study is a part of larger study and included the data only of 06 months. Data was collected after taking a written consent and 100 patients were assessed, 50 with bladder cancer and 50 with RCC. The sample size was considered according to convenience random sampling technique. All new registered cases who were undergoing surgery with a diagnosis of renal and bladder cancer were taken into consideration.

Inclusion Criteria

for this study were diagnosed RCC and BC patients: (1) over 18 years of age, (2) with primary education or higher, (3) who were planned for surgery for BC and RCC in the form of TURBT/Cystectomy or nephrectomy.

Exclusion Criteria

included patients who (1) had a history of mental illness prior to cancer diagnosis and (2) had other coexisting cancers.

Anxiety and depression symptoms were assessed with the Hospital Anxiety and Depression Scale (HADS), which is a routinely used scale to assess patients' levels of anxiety and depression. It is a self-administered questionnaire which was given to the patient after gaining their informed consent and was intended to be returned within one week following surgery. It consists of 14 items, seven related to anxiety and seven related to depression. Each item is answered on a 4-point Likert-type scale ranging from "Yes definitely" to "No, not at all" marked from '3' to '0'. It assesses both anxiety (HADS-Anxiety) and depression (HADS-Depression) levels with a same number of questions. Scoring 0-7 means non cases, 8-10 makes borderline case and more than 11 are cases of anxiety and depression. Higher score means more serious anxiety and depression symptoms (33).

Demographic Characteristics

In this study, information on gender, age, marital status, education, employment status, and cancer stage was gathered. "18-35 years," "36-50 years," and "over 50 years" were the categories for age. Higher secondary, graduate, graduation, and above were the several categories for educational levels. Marital status was divided into two categories: married and single. The stages of cancer were labelled "I," "II," and "III".

Statistical Analysis

SPSS 22 software was used to analyse the data. For HADS anxiety and depression scores, descriptive statistics (mean and standard deviation) were computed. To summarise qualitative data, frequencies and percentages were computed. Other statistical tests, such as the t-test and one way ANOVA, were used to determine the degree of anxiety and depression among patients with renal and urinary bladder cancer.

RESULTS

This was a six-month hospital-based cross-sectional study involving newly diagnosed renal and urinary bladder cancer patients getting surgical treatment at a tertiary care hospital in New Delhi. The study included patients of both genders over the age of 18 and up to 75 years. During the study period, in total a sample of 100 cancer patients, (50 with bladder cancer and 50 of had renal cancer) were interviewed and screened for anxiety and depression. The severity scores of anxiety and stress according to HADS are shown in Table 1. For the statistical analysis, SPSS 22 was employed.

Table 1: HADS (Hospital Anxiety and Depression Scale) Scores For The Assessment Of Depression And Anxiety In Urinary Bladder And Cancer Patients (N=100)

SEVERITY	NON-CASE	BORDERLINE CASE	CASE
HADS DEPRESSION	0-7	8-10	11-21
HADS ANXIETY	0-7	8-10	11-21

The HADS mean anxiety score in renal cancer patients is higher than HADS mean score in bladder cancer patients, according to Table 2, and the difference is highly statistically significant ($t=1.98$, $p=0.00$). The HADS mean depression score in renal cancer patients is somewhat (borderline) greater than in urinary bladder cancer patients, and the difference is found to be statistically significant ($t=1.98$, $p=0.012$).

Table 2 Displays The Mean, Standard Deviation, And T-test Values For Depression And Anxiety In Patients With Urinary Bladder And Renal Cancer.

Group	N	Mean	SD	t	P-value
HADS- Anxiety (Renal Cancer)	50	10.16	4.70	1.98	0.00
HADS- Anxiety (Bladder Cancer)	50	8.58	5.55		
HADS- Depression (Renal Cancer)	50	9.74	2.24	1.98	0.012
HADS- Depression (Bladder Cancer)	50	8.58	2.27		

SD- standard deviation; t: independent t test

Table 3 Compares The Mean Scores Of HADS Anxiety, HADS Depression, And Socio-demographic Factors Among Renal Cancer Patients:-

Variables	N	HADS ANXIETY MEAN (SD)	HADS DEPRESSION MEAN (SD)
Gender			
Male	33	1.7(2.8)	1.17(2.3)
Female	17	4.0(4.8)	2.1(2.9)
T		0.91	2.54
p-value		0.01**	0.02*
Age group (in years)			
18-35	4	2.1(1.6)	2.1(2.6)
36-50	23	2.3(1.4)	2.4(2.2)
50 and above	23	2.9(4.4)	2.2(2.6)
F		3.12	0.09
p-value		0.01**	0.91
Marital status			
Married	41	2.2(2.8)	2.2(3.3)
Single	9	1.6 (1.4)	1.6(2.7)
T		0.44	0.41
p-value		0.33	0.67
Education			
Higher Secondary	29	3.8(2.6)	2.4(2.2)
Graduate	15	2.8(3.2)	2.1(3.4)
Graduate and above	6	1.6(2.0)	2.2(1.6)
F		0.80	0.09
p-value		0.71	0.91
Employment status			
Working	39	5.1(5.2)	2.6(1.5)
Not working/retired	11	3.0(4.9)	2.1(1.2)
T		-0.45	-0.34
p-value		0.29	0.41
Cancer stage			
Stage I	17	2.6 (3.2)	0.9(1.4)
Stage II	29	2.9(4.4)	1.7(1.5)
Stage III	2	3.9(2.7)	3.8(2.6)
F		3.14	0.29
p-value		0.01**	0.18

SD- standard deviation; t: independent t test; F: one way ANOVA; *significance level at 0.05; **significance level at 0.01

The mean scores of HADS- Anxiety ($t = 0.91$, $p = 0.01$) and HADS-Depression ($t = 2.54$, $p = 0.02$) were statistically different across genders. The mean HADS-Anxiety scoring ($t = 3.12$, $p = 0.01$) was found to be substantially different between age groups. Similarly, the mean scores of HADS- Anxiety ($t=3.14$, $p=0.01$) and HADS Depression ($t=0.29$, $p=0.18$) in renal cancer patients were found to be substantially different between cancer stages.

Participants aged 50 and more, with higher secondary education and working, reported significantly lower psychological well-being than their younger, graduated, and retired counterparts. Females had higher HADS-Anxiety and HADS-Depression scores than males.

When compared to single participants, married participants had higher

mean scores in HADS-Anxiety and HADS-Depression. Finally, patients with stage III and stage II had higher mean scores in HADS-Anxiety and HADS-Depression than patients with stage I (Table 3).

Similarly the HADS Anxiety ($t=3.12$, $p=0.01$) mean scores of male and female were found to be statistically more significant than HADS depression ($t=0.09$, $p=0.91$) mean scores in urinary bladder cancer patients. The risk of anxiety in cancer stage III and stage II was higher as compared to patients who were observed in stage I and found highly statistically significant ($t=2.87$, $p<0.01$). Similarly, HADS depression mean core was found to be statistically significant in different cancer stages ($t=2.42$, $p=0.02$). As regards HADS depression and anxiety mean scores for marital status and employment status were not statistically significant. Urinary bladder Cancer group with age 18-35, 50 and above, educated with graduation were observed with more anxiety and depression symptoms as compared to the population falling within 35-50 age group (Table 4).

Table 4 Shows The Comparison Of Mean Scores Of HADS Anxiety, HADS Depression And Socio-demographic Characteristics Taken Into Consideration For Urinary Bladder Cancer Patients

VARIABLES	N	HADS ANXIETY MEAN(SD)	HADS DEPRESSION MEAN (SD)
Gender			
Male	37	2.2(1.6)	1.17(2.3)
Female	13	2.3(1.4)	2.1(2.9)
T		3.12	2.5
p-value		0.01**	0.02*
Age group(in years)			
18-35	2	2.6(1.7)	2.4(2.2)
36-50	18	2.3(1.6)	2.2(1.6)
50 and above	30	2.4(1.8)	2.8(4.2)
F		2.48	0.09
p-value		0.02*	0.91
Marital status			
Married	45	3.5(4.8)	3.2(4.2)
Single	5	3.2(4.4)	2.7(3.2)
T		0.71	0.57
p-value		0.77	0.81
Education			
Higher Secondary	15	2.0(1.5)	2.1(1.3)
Graduate	30	2.2(1.4)	2.2(1.6)
Graduate and above	5	2.6(1.4)	2.4(1.4)
T		2.87	3.12
p-value		<0.01**	0.01**
Employment status			
Working	18	1.6(2.0)	2.0(3.2)
Not working/retired	32	1.8(2.8)	3.1(4.4)
T		-0.51	-0.22
p-value		0.61	0.91
Cancer stage			
Stage I	22	2.0(1.5)	2.1(1.3)
Stage II	24	2.3(1.4)	2.2(1.4)
Stage III	4	2.6(1.4)	2.6(1.4)
T		2.87	2.42
p-value		<0.01**	0.02*

SD- standard deviation; t: independent t test; F: one way ANOVA;

*significance level at 0.05; **significance level at 0.01

DISCUSSION

The current study found the presence of psychological disorders mainly anxiety in about 65-70% of patients diagnosed with urinary bladder and renal cancer. In this study, we discovered that the HADS anxiety mean score was higher in renal cancer patients than in urinary bladder cancer patients in the Indian population who were undergoing surgical treatment. Another investigation conducted by Türev Demirtaş et al. observed that psychological illnesses of anxiety, sadness, and stress were present in approximately 90% of kidney and bladder cancer patients (34).

Surprisingly, our data revealed that depressive symptoms were borderline in patients with kidney cancer, affecting their quality of life

(QOL) and recovery. However, the population with urinary bladder cancer was shown to be more protective, with fewer signs of sadness. A recent study found that cancer patients are more prone than non-cancer patients to acquire depression, which impairs their QOL and prognosis (35)

The interpretation of HADS scores revealed the presence of anxiety and sadness in individuals with renal and bladder cancer. However, when comparing the HADS anxiety and depression scores of renal cancer and bladder cancer, individuals with renal cancer were shown to be more worried and had fewer depressive symptoms than those with bladder cancer. Another study found that anxiety and despair were common among cancer patients. The authors advocate screening and counselling for anxiety and depression in cancer patients to help them cope with their disease and reduce the negative consequences on their mental health (36).

Long-term and late consequences of cancer treatment are likely to have an impact on cancer survivors' mental health, potentially leading to sadness and anxiety (37). We feel that the limitation of our study is that it is a single centred study and comparison of anxiety and depression scores pre surgery and post-surgery has not been included.

Recently, the National Cancer Study Institute in the United Kingdom advised that priority studies be directed towards the short- and long-term psychological difficulties associated with cancer and its treatment (38). It is obvious that a more personalised strategy to support people with cancer's psychological health is required to prevent anxiety and depression, which lead to poor QOL in cancer patients (39).

CONCLUSION

The goal of this study was to investigate the prevalence of anxiety and depression in patients undergoing cancer treatment for renal and bladder cancer. Our study discussed that depending on the stage of illness, people exhibit anxiety and depression symptoms in both renal and bladder cancer.

We discovered that people who had surgery for renal cancer had more anxiety and depression symptoms than those who had surgery for bladder cancer. Patients who were more nervous experienced severe depression. As a result, it is seen that cancer patients are more likely to experience depression and anxiety, resulting in a lower quality of life. According to our findings, cancer patients with renal and urinary bladder cancer are more likely to have a variety of psychological illnesses, including depression and anxiety.

Patients were initially unaware of their illnesses, but after being diagnosed, they began to exhibit anxiety symptoms. Anxiety symptoms were more commonly observed in patients with stages II, III, and IV. Therefore, our study stresses the point that If these symptoms are not recognised and addressed, in future they might lead to chronic depression after cancer treatment which can deteriorate the Quality of life of patients in the long term.

To help cancer patients across the country, psychologists, public health specialists, social workers, and government and non-government groups should step forward in the future. We believe that excellent cancer care includes continual screening for anxiety, depression and sadness. Following the diagnosis of clinically significant psychological diseases, it is vital that suitable treatment measures be implemented in order to enhance the patients' mental health and quality of life.

REFERENCES

- Sharma V, Choudhary S, Srivastava M et al. Prevalence of depression, anxiety and stress among cancer and chronic kidney disease patients. *Int J Health Sci Res.* 2019; 9(4):1-6.
- Nakash O, Levav I, Aguilar-Gaxiola S, et al. (2013). Comorbidity of common mental disorders with cancer and their treatment gap: findings from the World Mental Health Surveys. *Psychosomatics*, 23(1),4051.
- American Cancer society. Emotional, Mental Health and mood changes <http://www.cancer.org/statfacts/html/urinb.html>. accessed on 2023/06/16.
- Peired AJ, Campi R, Angelotti ML, Antonelli G, Conte C, Lazzeri E, Becherucci F, Calistri L, Serni S, Romagnani P. Sex and Gender Differences in Kidney Cancer: Clinical and Experimental Evidence. *Cancers (Basel)*. 2021 Sep 13;13(18):4588.
- Jubber I, Ong S, Bukavina L, Black PC, Compérat E, Kamat AM, Kiemeny L, Lawrentschuk N et al. Epidemiology of Bladder Cancer in 2023: A Systematic Review of Risk Factors. *European Urology*. 84;2 (2023), 176-190.
- SEER Cancer Stat Facts: Bladder Cancer. National Cancer Institute. Bethesda, MD, <https://seer.cancer.gov/statfacts/html/urinb.html>.
- Cooke IJ, Patil D, Bobrek K, et al. Longitudinal impact of bladder cancer diagnosis on common psychiatric disorders. *Cancer Med.* 2021;10(23):8412-8420.
- Klaassen Z, Wallis CJD, Chandrasekar T, et al. Cancer diagnosis and risk of suicide after accounting for prediagnosis psychiatric care: A matched-cohort study of patients with

- incident solid-organ malignancies. *Cancer*. 2019;125(16):2886-2895.
9. Grassi L. Psychiatric and psychosocial implications in cancer care: the agenda of psycho-oncology. *Epidemiol Psychiatr Sci*. 2020;29.
 10. Pandey M, Devi N, Thomas BC, Vinod Kumar S, Krishnan R, Ramdas K. Distress overlaps with anxiety and depression in patients with head and neck cancer. *Psycho-Oncology: Journal of the Psychological, Social and Behavioral Dimensions of Cancer*. 2007;16(6):582-586.
 11. Wu Y-S, et al. Anxiety and depression in patients with head and neck cancer: 6-month follow-up study. *Neuropsychiatric Disease and Treatment*. 2016;12:1029.
 12. Mason, A., Juyal, R., Das, S. C., Shikha, D., Saini, S., & Semwal, J. (2019). Prevalence and correlates of psychological distress among cancer patients in a tertiary care hospital in northern India. *International Journal Of Community Medicine And Public Health*, 6(5), 2223-2228.
 13. Yang YL, Liu L, Wang Y, Wu H, Yang XS, Wang JN, et al. The prevalence of depression and anxiety among Chinese adults with cancer: a systematic review and meta-analysis. *BMC cancer*. 2013; 13: 393.
 14. Cooke IJ, Patil D, Bobrek K, et al. Longitudinal impact of bladder cancer diagnosis on common psychiatric disorders. *Cancer Med*. 2021;10(23):8412-8420.
 15. Lefaucheur C, Stengel B, Nochy D, et al. Membranous nephropathy and cancer: Epidemiologic evidence and determinants of high-risk cancer association. *Kidney Int*. 2006;70:1510-1517.
 16. Chen W, Zheng R, Baade PD, et al. Cancer statistics in China, 2015. *CA Cancer J Clin* 2016;66:115-32. 2. Torre LA, Bray F, Siegel RL, et al. Global cancer statistics, 2012. *CA Cancer J Clin* 2015;65:87-108.
 17. Klaassen Z, Wallis CJD, Goldberg H, et al. The impact of psychiatric utilisation prior to cancer diagnosis on survival of solid organ malignancies. *Br J Cancer*. 2019;120(8):840-847.
 18. Li M, Wang L. The associations of psychological stress with depressive and anxiety symptoms among Chinese bladder and renal cancer patients: the mediating role of resilience. *PLoS One*. 2016;11:e0154729.
 19. Pham H, Torres H, Sharma P. Mental health implications in bladder cancer patients: a review. *Urol Oncol*. 2019;37:97-107.
 20. Smith AB, Jaeger B, Pinheiro LC, et al. Impact of bladder cancer on health-related quality of life. *BJU Int*. 2018;121:549-557.
 21. Vartolomei L, Ferro M, Mirone V, Shariat SF, Vartolomei MD. Systematic review: depression and anxiety prevalence in bladder cancer patients. *Bladder Cancer*. 2018;4:319-326.
 22. Packiam VT, Tyson Ii MD, Tsivian M, Lohse CM, Boorjian SA, Cheville JC, Costello BA, Leibovich BC, Thompson RH. The association of anxiety and depression with perioperative and oncologic outcomes among patients with clear cell renal cell carcinoma undergoing nephrectomy. *Urol Oncol*. 2020 Feb;38(2):41.e19-41.e27.
 23. Zeng H, Zheng R, Guo Y, Zhang S, Zou X, Wang N, et al. Cancer survival in China, 2003-2005: A population-based study. *Int J Cancer*. 2014; 136: 1921-1930.
 24. Bird J, Hayter M. A review of the literature on the impact of renal cancer therapy on quality of life. *J Clin Nurs*. 2009; 18: 2783-2800.
 25. Beisland C, Beisland E, Hjielle KM, Bostad L, Hjermstad MJ, Aarstad AKH, et al. Health-related quality of life in long-term survivors after renal cancer treatment. *Scand J Urol*. 2014; 48: 52-64.
 26. Botteman MF, Pashos CL, Hauser RS, Laskin BL, Redaelli A. Quality of life aspects of bladder cancer: a review of the literature. *Qual Life Res*. 2003; 12: 675-688.
 27. Månsson Å, Månsson W. When the bladder is gone: quality of life following different types of urinary diversion. *World J Urol*. 1999; 17: 211-218.
 28. Cella D. Quality of life in patients with metastatic renal cell carcinoma: the importance of patient-reported outcomes. *Cancer Treat Rev*. 2009; 35: 733-737.
 29. Yang YL, Liu L, Wang Y, Wu H, Yang XS, Wang JN, et al. The prevalence of depression and anxiety among Chinese adults with cancer: a systematic review and meta-analysis. *BMC Cancer*. 2013; 13: 393.
 30. Kwekkeboom KL, Seng JS. Recognizing and responding to post-traumatic stress disorder in people with cancer. *Oncol Nurs Forum*. 2002; 29: 643-650.
 31. Mitchell AJ, Chan M, Bhatti H, Halton M, Grassi L, Johansen C, et al. Prevalence of depression, anxiety, and adjustment disorder in oncological, haematological, and palliative-care settings: a meta-analysis of 94 interview-based studies. *Lancet Oncol*. 2011; 12: 160-174.
 32. Massie MJ. Prevalence of depression in patients with cancer. *J Natl Cancer Inst Monogr*. 2004; 32: 57-71.
 33. Satin JR, Linden W, Phillips MJ. Depression as a predictor of disease progression and mortality in cancer patients. *Cancer*. 2009; 115: 5349-5361.
 34. Demirtas, T, and Temircan Z. Examining the Relationship between Depression, Anxiety and Stress in Kidney Cancer Patients. *J Kidney Cancer VHL*. 2021; 9(1): 19-26.
 35. Young K, Singh G. Biological mechanisms of cancer-induced depression. *Front Psychiatry* 2018;9:299.
 36. Khalil A, Faheem M, Fahim A, et al. Prevalence of depression and anxiety amongst cancer patients in a hospital setting: a cross-sectional study. *Psychiatry J* 2016. 1-6.
 37. Shapiro CL. Cancer survivorship. *N Engl J Med* 2018;379(25):2438-2450.
 38. National Cancer Research Institute. The UK Top living with and beyond cancer research priorities. [https://www.ncri.org.uk/ lwbc/#lwbc_questions]. Accessed 25 January 2023.
 39. Alfano CM, Mayer DK, Bhatia S, et al. Implementing personalized pathways for cancer follow-up care in the United States: proceedings from an American cancer society-American society of clinical oncology summit. *CA Cancer J Clin* 2019;69(3):234-247.