MERIT RESEARCH JOURNALS
www.meritresearchjournals.org

Merit Research Journal of Medicine and Medical Sciences (ISSN: 2354-323X) Vol. 5(12) pp. 666-673, December, 2017
Available online http://www.meritresearchjournals.org/mms/index.htm

Original Research Article

Assessment of Anxiety and Depression among Adult Cancer Patients on Chemotherapy Regimens

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Abstract

The aim of the present study was to explore changes in the levels of anxiety and depression in adult cancer patients during the course of cancer chemotherapy. The Hospital Anxiety and Depression Scale (HADS) was used in cancer patients (n = 251, 43.4% male, mean age 57.7 ± 28.4 years) upon their visit to oncology clinics in comparison to non-cancer patients (n = 257, 47.1% male, mean age 62.3 ± 25.2 years), randomly selected from different clinics. The findings revealed a significant increase in the borderline anxiety and depression in cancer patients before starting chemotherapy irrespective of chemotherapy period or the type of cancer when compared to non-cancer group (P<0.0001). Both anxiety and depression levels were increased by the three month-period after initiating chemotherapy, then declined after 6 months of initiating chemotherapy and towards the end of the treatment. Noticeably, a significant increase in the number of female patients who had anxiety by the three month-period after chemotherapy (p-value = 0.0002), whereas male patients showed a significantly established depression after 6 months of initiating treatment (p-value = 0.002). Hence, anxiety and depression concerns should be continuously evaluated in cancer patients and if possible alleviated to improve patient quality of life.

Keywords: Anxiety, Depression, Cancer Patients, Chemotherapy, HADS

INTRODUCTION

The current cancer therapies are frequently associated with several distressing side-effects. Although, some cancer chemotherapy are accompanied with serious adverse events, such as cardiotoxicity (Volkova and Russell, 2011), neuropathy (Grisold et al., 2012) or pulmonary fibrosis (Patil et al., 2016), most patients' complaints were directed toward lower hazardous side-effects which directly interfere with their quality of life (QoL). Among those concerns are nausea and vomiting (Janelsins et al., 2013), oral mucositis (Araújo et al., 2015), hair loss (Park et al., 2014), diarrhea or constipation (McQuade et al., 2016) and general weakness (Abdel-Razaq et al., 2017).

Several studies have described psychological concerns as a persistent component in cancer patients at various stages of cancer diagnosis and treatment that could lead to anxiety or depression (Breen et al., 2009; Grassi et al., 2013; Wagland et al., 2015). Distress symptoms were also reported in cancer patients even before initiating their chemotherapy (Breen et al., 2009). According to several reports, the overall prevalence rate of clinically significant depression in cancer patients ranged from less than 10% to 25%, which may escalate up to more than 50% in hospitalized acute patients (Mitchell et al., 2011; Walker et al., 2013; Krebber et al., 2014; Chan and Ismail, 2014).

Depression not only can impair the QoL of the patients but also of their families. The increased complaints of fatigue and general weakness usually described in cancer patients could contribute to the aggravation of

depression symptoms. It has also already been recognized that depression has a negative impact on therapeutic outcome as well as on the psychosocial life of individuals with diverse severities (Brenes, 2007). Therefore, healthcare providers should always remain vigilant for depression as a common psychological side-effect in cancer patients. Hence, effective management of depression, if possible, helps in enhancing the patient QoL, preventing further significant morbidities and eventually improving patients' survival rates.

Several screening and diagnostic tools were developed in the clinical practice for assessing and evaluating mental health disorders in patient. Patient Health Questionnaire-9(PHQ-9), Generalized Anxiety Disorder-7 (GAD-7) and Hospital Anxiety and Depression Scale (HADS) were established as valid and reliable convenient self-administered instruments that have been widely used by clinicians in identifying and monitoring the severity of psychological distresses in primary care patients (Kroenke, Spitzer, and Williams 2001; Spitzer et al., 2006; Thomas et al., 2005). The present study aimed to explore changes in the levels of anxiety and depression during the course of cancer chemotherapy using HADS instrument in adult cancer patients.

Study Design

The levels of anxiety and depression among adult cancer patients were assessed using a valid, reliable Arabic-translated version of the Hospital Anxiety and Depression Scale (HADS) adopted form Terkawi et al., (2017). Cancer patients were asked to complete HADS assessment form upon their subsequent visits to the oncology clinics at King Abdulaziz Medical City in Riyadh, Saudi Arabia. Cancer patients were recruited after obtaining their written informed consent. A comparable number of participants without cancer randomly selected from different clinics were also enrolled in the study as a control group. This study was reviewed and approved by the Institutional Review Board at King Abdullah International Medical Research Center (KAIMRC), Riyadh, Saudi Arabia. The study was carried out over 6-month period from September 2016 to March 2017.

Newly diagnosed cancer patients were followed for 6 months starting form initiating chemotherapy or until they finished their treatment, whichever occurs earlier. Accordingly, participating cancer patients were categorized into three groups depending on the duration of chemotherapy treatment. Group I: newly diagnosed cancer patients before introducing their chemotherapy, Group II: patients after 3 months of starting chemotherapy, and group III: patients after 6 months of chemotherapy treatment. Statistical comparison was performed by analyzing data using t-test or Chi square to determine the significant influence or association of inter-individual variability on the level of anxiety and depression in cancer patients versus the control group with P value significant at < 0.05.

RESULTS

A total of 251cancer patients and 257 non-cancer patients were recruited in this study. Table 1 shows the general characteristics of the participating patients. The mean age of cancer patients was 57.7 ± 28.4 years (43.4% were male) and 62.3 ± 25.2 years for non-cancer patients (47.1% were male). The two groups were statistically comparable with a P value of 0.0539 (95% confidence interval - 0.07761 to 9.278). The participants' ages in the cancer group ranged from 22 to 67 years, while in the non-cancer group they ranged from 16-72 years.

The participating cancer patients were diagnosed with several malignancies including breast (36.3%), colorectal (29.9%), non-Hodgkin lymphoma (13.5%), and liver carcinomas (10.8%). Table 2 shows cancer type distribution in males and females of the cancer patients group. The most common health complaints in the non-cancer patients group were hypertension (34.6%), diabetes (28.4%), hyperlipidemia (14.0%) and upper respiratory tract infections (10.1%).

There was a wide variation in the side-effects complaints in the cancer patients group attributed mainly to their current chemotherapy regimens. The most common side-effects were nausea/vomiting (72.1%), mucositis (61.0%), fatigue (52.6%) and gastrointestinal upsets (39.0%). It is noteworthy that the majority of reported side-effects were either declined or do not change with the progress of the chemotherapy, except for fatigue, which was significantly increased (data not shown).

The summed-up scores for levels of anxiety and depression in the participants obtained from the HADS were divided into normal demeanor with scores of 7 or less, borderline ranged between 8 and 10 and abnormal or having anxiety/depression with scores of 11 and above. Comparisons were drawn between the two groups and among the cancer patients group taking into consideration type of cancers and chemotherapy duration as the main variables among the cancer patient participants.

Out of 251 cancer patients, 133 (53.0%) had borderline anxiety followed by 69 (27.5%) abnormal and only 49 (19.5%) were normal, which are significantly greater than that observed in non-cancer group, even before initiating their chemotherapy, with a P values of less than 0.0001 (Table 3). Likewise, the levels of depression in cancer patients were comparable to that of anxiety before starting chemotherapy with 67.3% borderline and 10.8% abnormal, which are also

Table 1. Profile of the Participating Patients.

	Cancer Patients n = 251	Non-Cancer Patients n = 257
Age group (years)		
Mean ± SD	57.7 ± 28.4	62.3 ± 25.2
Median (range)	54 (22-67)	49 (16-72)
Gender n (%)		
Male	109 (43.4%)	121 (47.1%)
Female	142 (56.6%)	136 (52.9%)
Nationality n (%)		
Saudi	242 (96.4%)	243 (94.6%)
Non-Saudi	9 (3.6%)	14 (5.4%)
Marital Status n (%)		
Never Married	85 (33.9%)	66 (25.7%)
Married	153 (61.0%)	172 (66.9%)
Divorced	6 (2.4%)	10 (3.9%)
Widowed	7 (2.8%)	4 (1.6%)
Missing	0 (0.0%)	5 (1.9%)
Smoking n (%)	29 (11.6%)	43 (16.7%)

Table 2. Distribution of cancer type in male and female Patients.

	Total n = 251	Males n = 109	Females n = 142
Type of Cancern (%)			
Breast cancer	91 (36.3%)	0 (0.0%)	91 (64.1%)
Colorectal cancer	75 (29.9%)	69 (63.3%)	6 (4.2%)
Non-Hodgkin lymphoma	34 (13.5%)	13 (11.9%)	21 (14.8%)
Liver cancer	27 (10.8%)	17 (15.6%)	10 (7.0%)
Other carcinomas	24 (9.6%)	10 (9.2%)	14 (9.9%)

Table 3. Levels of anxiety and depression in the participants.

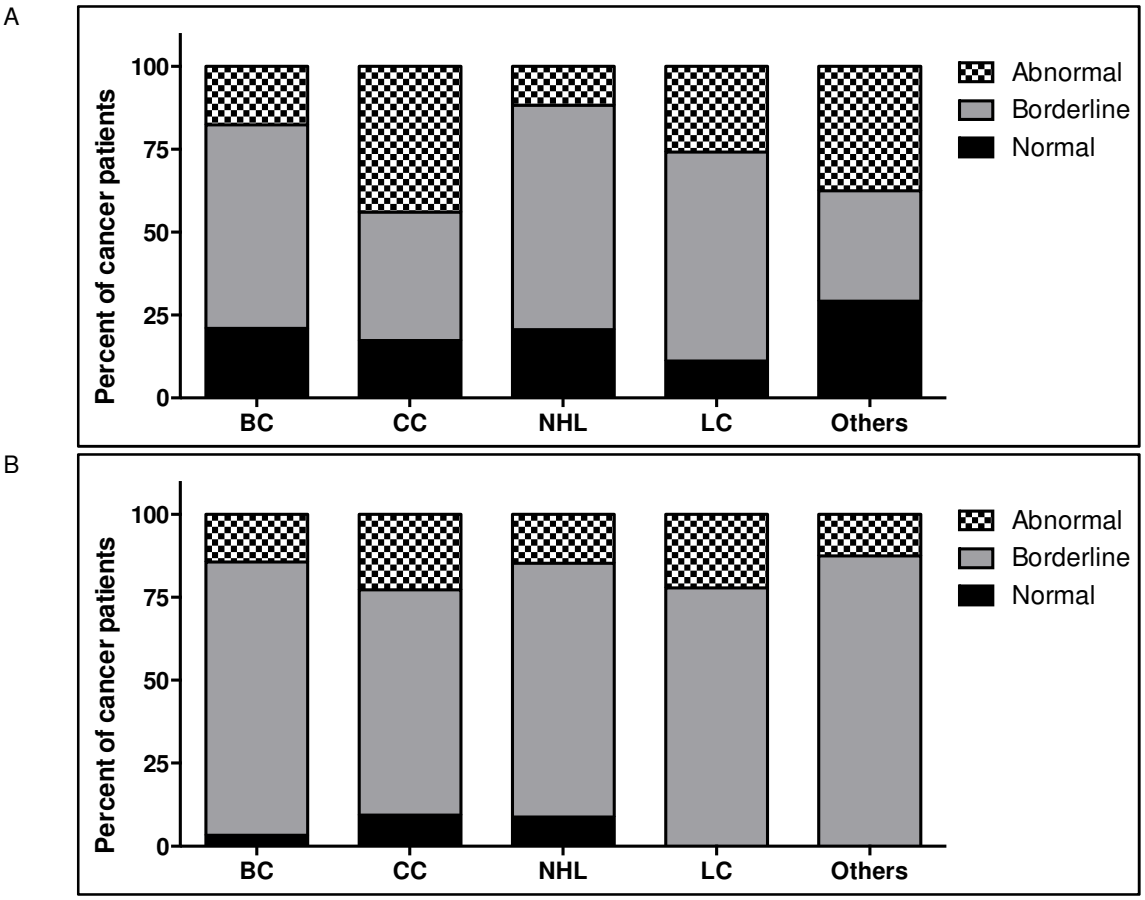
	Cancer group n = 251			Non-Cancer group $ n = 257
	I	II	III	
Level of Anxiety n (%)				
Normal	49 (19.5%)	13 (5.2%)	67 (26.7%)	175 (68.1%)***
	chi-square = 42.432, p-value < 0.00001			
Borderline	133 (53.0%)	194 (77.3%)	104 (41.4%)	61 (23.7%)***
	chi-square = 68.7012, p-value < 0.00001			
Abnormal	69 (27.5%)	44 (17.5%)	80 (31.9%)	21 (8.2%)***
	chi-square = 14.2267, p-value = 0.00081			
Level of Depression n (%)				
Normal	55 (21.9%)	31 (12.4%)	122 (48.6%)	197 (76.7%)***
	chi-square = 88.6515, p-value < 0.00001			
Borderline	169 (67.3%)	73 (29.1%)	97 (38.6%)	46 (17.9%)***
	chi-square = 80.3509, p-value < 0.00001			
Abnormal	27 (10.8%)	147 (58.6%)	32 (12.7%)	14 (5.4%)*
	chi-square = 184.7717, p-value < 0.00001			

Tags: Group I cancer patients before initiating their chemotherapy; group II Cancer patients after 3 months of chemotherapy and group III Cancer patients after 6 months or once their chemotherapy treatment is completed, whichever occurs earlier. **$** Statistical comparisons were also performed between non-cancer and cancer patients before starting their chemotherapy (group A); where * $P \leq 0.05$; and *** $P \leq 0.001$.

Table 4. Levels of anxiety and depression comparison between males and females in the participating cancer patients group.

	Prior to chemotherapy		3 months after chemotherapy		6 months after chemotherapy	
	Male n = 109	**Female n = 142**	**Male n = 109**	**Female n = 142**	**Male n = 109**	**Female n = 142**
Level of Anxiety n (%)						
Normal	16 (14.7%)	33 (23.2%)	9 (8.3%)	4 (2.8%)	25 (22.9%)	42 (29.6%)
Borderline	65 (59.6%)	68 (47.9%)	80 (73.4%)	114 (80.3%)	45 (41.3%)	59 (41.5%)
Abnormal	28 (25.7%)	41 (28.9%)	20 (18.3%)	24(16.9%) [b]	39 (35.8%)	41 (28.9%)
Level of Depression n (%)						
Normal	21 (19.3%)	34 (23.9%)	15 (13.8%)	16 (11.3%)	48 (44.0%)	74 (52.1%)
Borderline	81 (74.3%)	88(62.0%) [a]	29 (26.6%)	44 (31.0%)	39 (35.8%)	58 (40.8%)
Abnormal	7 (6.4%)	20 (14.1%)	65 (59.6%)	82 (57.7%)	22 (20.2%)	10 (7.0%) [c]

Tags: [a]Chi-square statistic is 4.269 (p-value = 0.0388); [b] chi-square statistic is 13.7047 (p-value = 0.0002); and [c] chi-square statistic is 9.5734 (p-value = 0.0020)



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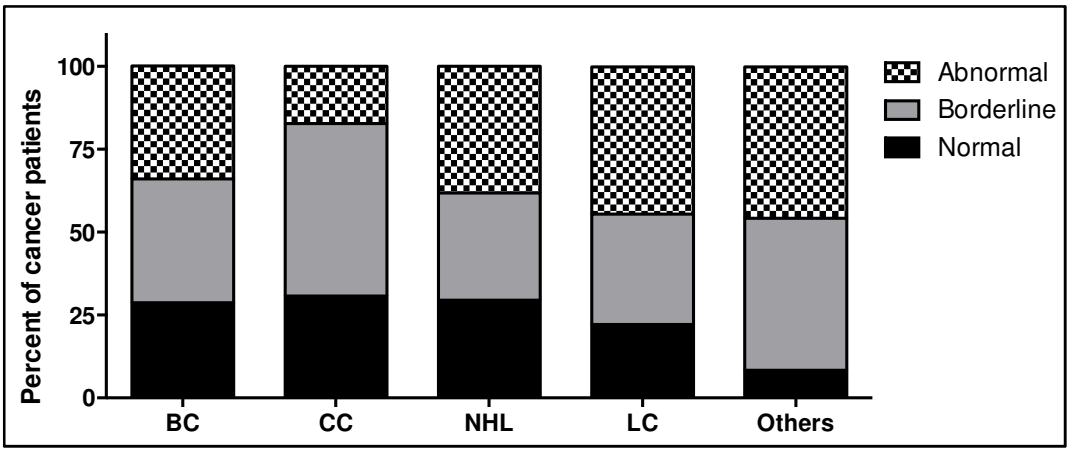
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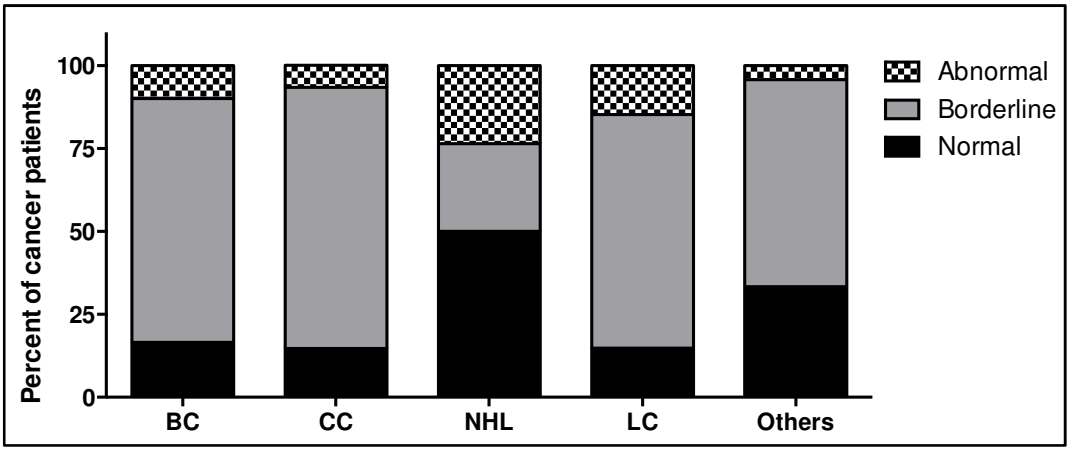
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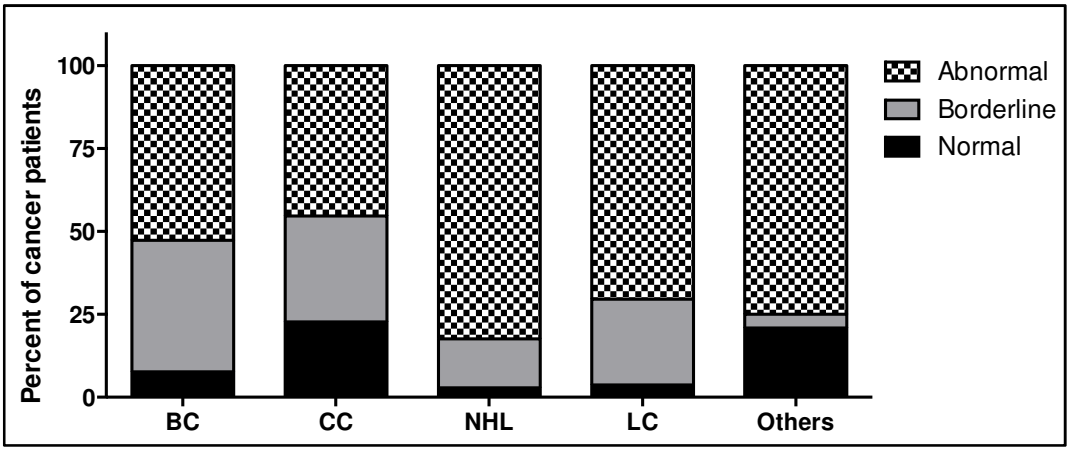
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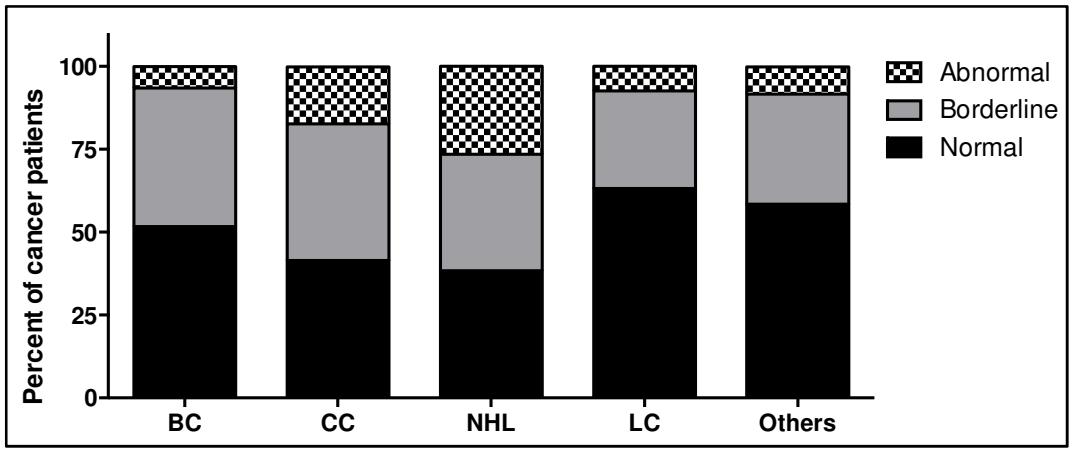

Figure 1: Percentage of cancer patients with different levels of anxiety (A: group I, B: group II, C: group III) and depression (D: group I, E: group II, F: group III) according to the type of cancer in the participating cancer patients group. Where, BC = Breast cancer; CC = Colorectal cancer; NHL = non-Hodgkin lymphoma; and LC = liver cancer

significantly greater than that in non-cancer group. Levels of abnormality (i.e., having anxiety or depression) are significantly higher among cancer group compared to the non-cancer group regardless of the elapsed time period of chemotherapy (Table 3).

Moreover, the largest proportion of cancer patients 41.4%–77.3% and 29.1%-67.3% had borderline anxiety and depression, respectively throughout the entire period of chemotherapy. They are followed by patients having abnormal anxiety/depression and patients with no anxiety/depression.

The levels of anxiety (borderline and abnormal) in the cancer patient had steadily increased from the beginning of the chemotherapy up to the three month-period after chemotherapy, which were then declined after 6 months of initiating chemotherapy and towards the end of the treatment. Remarkably, more than half of the participating cancer patients (58.6%) showed a substantial increase in depression (abnormal) by the three month-period after starting of chemotherapy. Statistical comparisons also revealed significant differences in the levels of anxiety and depression in cancer patients when carried out in cancer patients according to chemotherapy durations, with a P values of less than 0.05 (Table 3).

Table 4 shows a comparison of anxiety and depression levels between the two genders in the cancer group, which reveals a significant increase in the number of female patients who had abnormal anxiety by the three month-period after chemotherapy (p-value = 0.0002). Noticeably, a significant increase in the borderline depression was also disclosed in female patients before starting chemotherapy (p-value = 0.04). However, significantly more male patients had established depression (abnormal) after 6 months of initiating chemotherapy and towards the end of the chemotherapy treatment (p-value = 0.002).

Figure 1 shows similar disseminations of anxiety and depression levels among cancer patients group when were schemed according to the type of cancer. The majority of participating cancer patients exhibited borderline anxiety (33.3%-67.6%) and borderline depression (26.5%-78.7%) before introducing their chemotherapy, which are substantially towering in case of breast cancer, non-Hodgkin lymphoma and liver cancer patients. The borderline anxiety is even heightened by the three month-period then slightly diminished after 6 months of chemotherapy. However, the levels of depression (borderline and abnormal) were immensely reduced with the progress of the treatment in most cancer types.

DISCUSSION

Although, several studies have reported anxiety and depression as common events frequently in cancer patients undergone chemotherapy, these distressing symptoms are frequently underdiagnosed or overtaken by other disturbing side-effects (Reich 2008). Unrecognizing and subsequently undertreated these symptoms could eventually lead to undisputed morbidities, which impair patient QoL.

This is a cross-sectional questionnaire-based survey study. The HADS instrument was employed in this study to assess changes in the levels of anxiety and depression in adult cancer patients receiving cancer chemotherapy with progress of their treatment. HADS is a valid and reliable tool used in various correlational and comparison studies (Senturk et al., 2007; Soares-Filho et al., 2009) with an acceptable internal consistency

(Djukanovic, Carlsson, and Arestedt, 2017). An Arabic-translated version of HADS was used in the present study, which has been recently validated by Terkawi et al. (2017).

A significant number of anxiety and depression was revealed in cancer patients in comparison to non-cancer patients, even before initiating their chemotherapy. This is undoubtedly because of the psychological distress in the newly diagnosed cancer patients due to their preconceived ideas of this malicious disease. Moreover, the unwarranted fear of the lack of therapeutic efficacy of existing cancer chemotherapy and/or the anticipated suffering due to associated side-effects may aggravate such distress. Further catastrophic escalation of the borderline anxiety and depression was also observed in cancer patients by the three month-period after chemotherapy, which could reflect a genuine agony as a result of the chemotherapy toxicities and deleterious side-effects. A substantial increase in the depression was also reported in cancer patients as a result of the intolerable cancer pain (Fischer et al., 2010) or sleep disturbances (Irwin et al., 2013).

Unlike a recent report by de Almeida Macedo et al., (2017), the current study revealed a slight but significant increase in the number of female cancer patients with borderline depression before starting chemotherapy and abnormal anxiety three months after chemotherapy. Although anxiety was intensified after 6 months of initiating chemotherapy, a significant decline of depression was found in the participants, especially in females by the end of the treatment. This substantial change could be due to the satisfactory management of the most disturbing chemotherapy side-effects which has been recently demonstrated in a study by Abdel-Razaq et al. (2017). Nausea/vomiting and oral mucositis could be effectively alleviated by palliative treatments. However, other side-effects such as hair loss, pain and fatigue, which are the most prevalent physical symptoms yet inadequately or difficult to control, remain the cause of serious concerns among cancer patients and pose a major challenge for healthcare providers (Ell et al., 2005; Breen et al., 2009).

Although, the levels of anxiety and depression differ widely from one type of cancer to another, there is general tendency for increasing the levels of borderline anxiety especially in breast cancer, non-Hodgkin lymphoma and liver cancer patients starting chemotherapy, which were further amplified after three months of their treatment, which could reflect a deteriorated QoL over the time. Remarkably, the levels of depression (borderline and abnormal) were impressively reduced with the progress of the treatment in most cancer types. This reduction could suggest acclimatization of the cancer patients during the stage of chemotherapy as a result of adaptation or coping with the chemotherapy side-effects that allows individuals to maintain performance across diverse health conditions.

Nevertheless, anxiety and depressive symptoms were not always recognized or distinctively described by the majority of cancer patients as side-effects attributed to their contemporary chemotherapy (Carelle et al., 2002; Abdel-Razaq et al., 2017). Ignoring these symptoms or the lack of awareness between patients and even healthcare providers for their prominence effects on imminent health of cancer patients contribute to the increase agony of cancer patients with the progress of the treatment. Such consequences could reflect bad on the potential therapeutic outcome and increases the burden of cancer chemotherapy. Therefore, pharmacological treatments in cancer patients should meditate both physical and psychosocial complaints that could appreciably help in minimizing potential deleterious side-effects and distresses, which ultimate improve chemotherapy outcome and patients QoL. Finally, the availability of valid and reliable patient assessment instruments such as HADS tool is vital to provide a quick and convenient method for recognizing and screening the severity of anxiety and depression in vulnerable patients in various clinical settings.

CONCLUSION

This study has demonstrated a significant rise in the anxiety and depression in cancer patients with progress of their course of treatment, which could suggest an undisputable suffering due to the chemotherapy side-effects. Therefore, it is pivotal to promote the awareness of healthcare providers for routine screening of anxiety and depression in cancer patients to enhance patient QoL for better therapeutic outcome. Employment of convenient and reliable tools such as HADS facilitates recognizing any abrupt mood changes in serious ill patients. Furthermore, endorsement of the patients' willpower for self-reporting every distressing side-effect is necessary for assessing and eventually alleviating these psychiatric symptoms before aggravation.

ACKNOWLEDGEMENT

Author would like to thank Dr. Abdulrahman Al Ghamdi, Mr. Mohammed Alzahrani, and the whole staff members of the Department of Oncology at King Abdulaziz Medical City – Riyadh for assisting in patient assessment and data collection.

Statement

Authors have no conflicts of interest to disclose.

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