

ORIGINAL ARTICLE

**ANXIETY AND DEPRESSIVE SYMPTOMS AND
HEALTH-RELATED QUALITY OF LIFE STATUS
AMONG PATIENTS WITH CANCER IN
TERENGGANU, MALAYSIA**

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Abstract

Objective: This study was aimed to determine the prevalence of anxiety and depressive symptoms, to examine their association with health-related quality of life (HRQoL) profiles and to determine the predictors on overall HRQoL. **Methods:** This was a cross-sectional study conducted in Hospital Sultanah Nur Zahirah, Kuala Terengganu, Malaysia. The Malay Hospital Anxiety and Depression Scale (HADS) and McGill Quality of Life Questionnaire (MMQoL) were administered to a sample of 150 cancer patients (mean age = 50.4 years). Chi-square test, correlation and multiple regression were utilised for data analysis. **Results:** The prevalence for mild anxiety and depressive symptoms was 30.7% and 23.3% respectively. The HADS-A correlated strongest with Total MMQoL Score ($r = -0.578$) and Psychological Well-Being ($r = -0.526$). Only HADS-A (beta = -0.486), and HADS-D (beta = -0.173) were significant in predicting overall health-related quality of life. **Conclusion:** Findings in our study indicated that the prevalence of anxiety and depressive symptoms in Terengganu cancer patients are moderate. If anxiety and depression are identified and treated, health-related quality of life among oncology patients appropriately could significantly be improved. *ASEAN Journal of Psychiatry, Vol.12(1): Jan – June 2011: XX XX*

Keywords: Anxiety, depression, health-related quality of life, cancer, prevalence

Introduction

The incidence of cancer is steadily increasing and had caused approximately 12% of all deaths worldwide [1]. It is expected that the prevalence of cancer will grow from 11.3 million cases in 2007 to

15.5 million cases by 2030 [2]. In Malaysia, cancer is one of the five principal causes of national mortality which also contributed 9.54 % of national death in 2004 and it has been estimated that about 30,000 new cases of cancer are being diagnosed annually [3]. The mushrooming of cancer prevalence has

resulted in more attention being directed towards the psychosocial outcomes of cancer sufferers globally.

Unsurprisingly, anxiety disorders occur frequently in patients with cancer compared to the general population[4]. It is generally agreed that cancer treatments such as surgery, chemotherapy and radiotherapy may produce various threats including possible disability or even loss of life, coping with new social situations, and deprivation of normal freedom which can all act as factors that induced psychological morbidity. Numerous studies in the clinical literature have documented the presence of raised anxiety levels in cancer patients especially those who will be undergoing treatment for the first time and those who had disease recurrence. Investigation on anxiety is less known than depression, however anxiety's disabling effects may as burdening as depression [5]. Undoubtedly, greater psychological morbidity in cancer patients is likely to speed up the disease progression and shorten survival. Another most prevalent psychological disorder in advanced and terminally ill palliative cancer care patients is depression [6]. The diagnosis of depression in cancer is usually complicated by the overlap of depression and sickness symptoms such as cancer-related fatigue (CRF) and pain. Many common symptoms of major depression were observed in cancer patients who do not endorse full depression symptoms [7]. The pathophysiology of cancer and the myelo-suppressive effects of cancer treatments can initiate inflammatory activation as well as lower haemoglobin levels. Anaemic patients may experience related symptoms such as fatigue, lethargy, palpitations and shortness of breath [8,9]. These symptoms further pose a significant risk of developing depression, hence impairing HRQoL [10,11]. Besides disease-related factors, lack of

social support, social isolation, hopelessness and unstable financial status have also been found to contribute to the risk of depression in cancer patients [12,13]. Screening for depression in oncology patients is therefore important as those patients were at the highest risk of clinical depression. The diagnosis for depressions in these patients is challenging and many patients who were affected by subclinical depression remained undetected.

HRQoL in cancer patients has gained a crucial role as a measure for disease outcomes and it is commonly perceived as a multidimensional construct affected by both the treatment and the disease. These encompass a range of domains namely physical health, life satisfaction, psychological well-being and self-integrity and self-care activities. HRQoL is primarily a subjective feeling and therefore every patient's HRQoL will be unique [14]. Physical symptoms, existential issues and psychological distress need more attention in cancer care as patients commonly reported problems regarding these aspects [15]. If HRQoL is not assessed, patients would continue to suffer silently and this consequently may even hasten death [16]. Furthermore, the pathopsychology conditions such as anxiety and depression have been shown to be strongly correlated with patient's desire to hasten death [17].

Screening is the optimal strategy for anxiety and depression, which are prevalent, treatable and beneficial from prompt treatment. Early detection and treatment of both disorders are essential to enhance HRQoL in their remaining life. Furthermore, undiagnosed and untreated depression may enhance suicidal mindset, prolong psychological suffering for the patient and family members, adversely affect compliance with cancer treatment, and the

ability of self-care [18]. As a result, it may hinder the effectiveness of cancer outcomes and perhaps unfortunately shorten their survival time. Many studies had been conducted on psychological distress and quality of life, however very few studies relate anxiety, depression and HRQoL among Malaysian patients. The current prevalence of psychological distress in relation to among cancer patients in the state of Terengganu, Malaysia, is less-explored than in other states. Moreover, available data regarding the psychological functioning is also limited. This study aimed to: (i) identify the prevalence of anxiety and depressive symptoms among Terengganu cancer sufferers, (ii) compare symptoms of anxiety and depression according to gender and chemotherapy treatment (iii) to investigate the association between anxiety and depressive symptoms with HRQoL components, and (iv) to determine the extent of prediction imposed by anxiety and depressive symptoms and socio-demographic characteristic (age) on overall HRQoL.

Methods

This was a cross-sectional study conducted in surgical ward and palliative wards at Hospital Sultanah Nur Zahirah, Kuala Terengganu, Malaysia. Data was collected from two samples: out-patients and in-patients who were diagnosed with cancer. Patients were recruited for the study when they were attended to in the oncology or surgical clinics/wards. They were enrolled from one out-patient clinic and four different wards of the hospital during a period of 11 months.

The criteria for inclusion in the study consisted of 1) diagnosis of cancer 2) no documented brain metastasis 3) ambulatory 4) a minimum age of 18 years old 5) able to

speak and read Malay language 6) not suffering from cognitive impairment 7) able to give informed consent 8) an estimated survival duration of more than six months. Participants who met the afore-mentioned inclusion criteria will be approached by the research assistants. Patients who were deemed too weak or too exhausted to complete the instruments, and those with unpredictable changes of condition or in immediate crisis that research involvement would impose a clinical burden that limit meaningful contribution of information were all excluded from the study. **Personal particulars.** Patients were asked to provide their demographic information in this form. It consisted of 12 questions which included: gender, age, marital status, living arrangement, race, religion, education level, occupation, monthly salary, type of cancer and staging. (Data was inserted into Table 1*)

Malay HADS. HADS is a self-screening questionnaire for psychopathological comorbidity which had also been used for wide range of patients from clinical to none clinical [19]. In this study, the validated Malay HADS was the instrument of choice [20,21]. Furthermore, according to Harter et al. (1997) HADS was a well-established screening instrument for anxiety and depression in cancer patients [22]. It consists of 14 questions, seven for anxiety (HADS-A) and seven for depression (HADS-D). The items were scored on a four-point scale from zero (not present) to three (considerable). HADS-A included item 2, 4, 6, 8, 11, 12, 14 and HADS-D included 1, 3, 5, 7, 9, 10, 13. HADS was used to screen the anxiety and depression level in “the past few days”. Each item score was summed, giving subscale scores on the HADS-A and the HADS-D from zero to 21. For each subscale, scores from 0-7 were categorised as “no problem”, 8 to 10 “mild symptom”, 12 to 14 “moderate

cases” and scores above 15 as “severe symptom”. In brief, any domain score ≥ 8 was considered as “case”.

Malay McGill Quality of Life Questionnaire (MMQoL). The McGill QoL Questionnaire (MQoL) was designed to measure HRQoL for people with life threatening illness [23]. The validated Malay translation of MQoL was utilised [24,25]. It possessed established use and the desired psychometric properties and consisted of 17 items, including a Global QoL question and the open-ended question, patients were encouraged to report issue which influenced their HRQoL [26]. The MQoL had been widely used in palliative care population and it had been shown to be useful to healthcare providers in a clinical setting and was preferred by nurses over the Hospice Quality of Life Index-Revised instrument [27]. Through the open-ended question the patients could report issue which influences their HRQoL. Five domains were assessed, *Physical Symptoms* (items 1 to 3), *Physical Well-Being* (item 4), *Psychological Well-Being* (items 5 to 8), *Existential Well-Being* (items 9 to 14) and *Support Issues* (items 15 and 16). The response categories ranged from 0 to 10 with anchor ends. The *Total MMQoL Score* was derived from the mean of all five domains. Both the sub-scale scores and *Total MMQoL Score* could range from 0 to 10, facilitating the identification of specific domains that need attention relative to overall HRQoL [28]. All questions in MMQoL could be answered using numerical value from 0 to 10. Larger numbers indicated more positive responses, except for items 1, 2, 3, 5, 6, 7, and 8. The first three questions allow the respondent to list down the three main physical symptoms that imposed the most problems which influenced their HRQoL. Scores for items 1 to 3 and 5 to 8 in MMQoL were transposed prior to data analysis. A score of 0 indicated

the least desirable and 10 represented the most desirable situation. For *Physical Symptoms* questions, a transposed score of 10 was assigned when the patients did not experience any physical symptoms. In this study, the reference of frame of “the past 2 days” was used due to the unpredictable nature of patient condition. The responsiveness to change tests showed that *Total MMQoL Score* and its subscales were able to detect change between good, average, and bad days [29]. As a result, this instrument is valuable to detect differences between good, average, or bad days among palliative care patients [30].

The protocol for this study was approved by the Clinical Research Centre (CRC) of Hospital Sultanah Nur Zahirah and Medical Research and the Ethics Committee (MREC) of Ministry of Health Malaysia (reference number : KKM/NIHSEC/08). Upon these approvals, the investigators informed the study centre authorities to decide on the most suitable time and date to conduct the study. Participants who met all the inclusion criteria were approached by two trained research assistants. Upon initial approach, patients were verbally briefed about the study and this was reinforced by the provision of an information sheet. Once the potential patients agreed, they were asked to sign a written consent form. After obtaining the consent, the research assistants proceeded to administer the Personal Particulars Form, MMQoL and HADS questionnaires. The research assistants remained with the all patients during the time they completed the instruments to assist them whenever needed.

SPSS 16.0 for Windows were used for data analysis. Socio-demographic data was analyzed descriptively and presented as frequencies. Preliminary testing on normality, linearity, multicollinearity, and

homoscedasticity were carried out of which the Kolmogorov-Smirnov statistics produced value greater than 0.05, indicating that the assumption of normality test was not violated. Pearson's correlation coefficient (r) was used as a measure for linear associations between parametric variables. Chi-square test for relatedness was performed to determine the relationships between psychological co-morbidity with gender and different treatment groups (chemotherapy vs. no chemotherapy). Independent t-tests were also computed for groups score comparisons for *Total MMQoL Score*, HADS-A and HADS-D. Multiple regression was used to determine the influence of anxiety and depression (in HADS) and socio-demographic variable (age) to predict patients' HRQoL status as measured by MMQoL. The value of $p < 0.05$ was considered significant.

Results

Responses were received from 150 out of 208 patients, hence with a participation rate of 78%. Fifty eight patients refused to participate due to unfavourable conditions such as fatigue, restlessness, nausea or febrility ($n = 36$), not interested ($n = 20$), and could not comprehend the purpose of study ($n = 2$). The mean age of participants were 50.4 years ($SD = 12.3$). Majority of the patients were Malays, and in total there were 60 males (40.0%) and 90 females (60.0%). At the time of the research nearly 75% of the patients were married and were staying with their family or partner. Over 50% of the patients had completed PMR education and majority earned less than RM 500 per month. Out of 150 patients, 64 (42.6%) were on chemotherapy treatment during the study period. The more comprehensive demographic and clinical characteristics of the recruited patients were presented in Table 1.

Table 1: Demographic and clinical characteristics of participants (n = 150).

| Mean age ± SD (range) | 50.4 ± 12.3 (18 - 72) | | |
|------------------------------------|------------------------------|-------------|-----------------|
| | n | Percent (%) | <i>p</i> value* |
| Gender | | | |
| Female | 90 | 60.0 | < 0.05 |
| Male | 60 | 40.0 | |
| Marital status | | | |
| Married | 128 | 85.3 | < 0.001 |
| Single/ divorced /widowed | 22 | 14.7 | |
| Race | | | |
| Malay | 138 | 92.0 | < 0.001 |
| Chinese | 12 | 8.0 | |
| Religion | | | |
| Islam | 138 | 92.0 | < 0.001 |
| Buddhist | 9 | 6.0 | |
| Christian | 3 | 2.0 | |
| Level of education | | | |
| Nil-Primary | 61 | 40.7 | <0.05 |
| Secondary (PMR/SPM) | 72 | 48.0 | |
| High school/College (STPM/Diploma) | 13 | 8.7 | |
| University (Bachelor/Master/PhD) | 4 | 2.7 | |
| Employment status | | | |
| Employed/Self-employed | 48 | 32.0 | < 0.001 |
| Unemployed/Retired | 70 | 78.0 | |
| Income | | | |
| < RM 500 per month | 107 | 71.3 | < 0.001 |
| > RM 500 per month | 43 | 29.7 | |
| Time since diagnosis | | | |
| Up to 1 year | 100 | 66.7 | < 0.001 |
| Up to 2 years and above | 50 | 33.3 | |
| Living arrangement | | | |
| Alone | 10 | 6.7 | < 0.001 |
| With family/partner | 140 | 93.3 | |
| On chemotherapy | | | |
| Yes | 64 | 42.7 | > 0.05 |
| No | 86 | 57.3 | |
| Type of cancer | | | |
| Breast | 53 | 35.3 | < 0.001 |
| Colorectal | 41 | 27.3 | |
| Gynaelogic | 16 | 10.7 | |
| Urologic | 15 | 10.0 | |
| Lung | 8 | 5.3 | |
| Others | 17 | 11.4 | |
| Stage of cancer* | | | |
| Unknown | 75 | 50.0 | < 0.001 |
| Stage I | 16 | 10.7 | |
| Stage II | 23 | 15.3 | |
| Stage III | 18 | 12.0 | |
| Stage IV | 18 | 12.0 | |

χ^2 tests for goodness of fit; $p < 0.05$ = significant.

Pilot study showed that the instruments used in the study were reliable tools. The level of internal consistency reliability for both HADS and MMQoL domains emerged as moderate to high. Again in this study, all Cronbach's α coefficient for both instruments exceeded 0.70 with the exception of *Support Issues* and *Total MMQoL Scores* (*Physical Symptoms* = 0.701, *Psychological Well-Being* = 0.865, *Existential Well-Being* = 0.817, *Support Issues* = 0.619, *Total MMQoL Score* = 0.659, *HADS-A* = 0.801, *HADS-D* = 0.739).

The prevalence of mild anxiety symptoms was found to be 30.7% and for depressive symptom, it was 23.3%. For moderate cases (*HADS* scores ≤ 11), the prevalence for anxiety symptoms was 14.0% ($n = 21$) and depression was 14.7% ($n = 22$) respectively.

More than 50% of the patients had no problem with depression and anxiety. The overall status of anxiety and depressive symptoms were displayed in Figure 1. The prevalence for combined anxiety and depressive symptoms according to *HADS* was only 20.8% (*HADS*-subscales ≥ 8).

The prevalence of anxiety and depressive symptoms according to gender and chemotherapy was demonstrated in Table 2. There was no significant difference between groups with respect to gender. Although no significant difference was reported in depressive symptoms within gender, the proportions of female who were depressed and anxious, were consistently higher compared to male patients.

Table 2: Prevalence of anxiety and depression vs. gender and chemotherapy treatment ($n = 150$).

| | HADS-A | | <i>p</i> value* | HADS-D | | <i>p</i> value* |
|---------------------|---------------|--------------|-----------------|---------------|--------------|-----------------|
| | No n (%) | Yes n (%) | | No n (%) | Yes n (%) | |
| Gender | | | | | | |
| Female | 51 (56.7%) | 39 (43.3%) | > 0.05 | 60 (66.7%) | 30 (33.3%) | > 0.05 |
| Male | 40 (66.7%) | 20 (33.3%) | | 37 (61.7%) | 23 (38.3%) | |
| Chemotherapy | | | | | | |
| Yes | 39(60.9 %) | 33 (39.1%) | > 0.05 | 30 (46.9%) | 34 (53.1%) | < 0.001 |
| No | 52 (60.5%) | 34 (39.5%) | | 67 (77.9%) | 19 (22.1%) | |

* X^2 tests for independence; $p < 0.05$ = significant.

Significant differences in depression scores were shown in *HADS-D* both in patients “undergoing” or “not undergoing” chemotherapy ($p < 0.001$), of which the

former patients were significantly more depressed. In Table 3, the detailed findings were displayed.

Table 3: Overall score description of HADS and MMQoL domains.

| Domain/subscale | All patients | | By gender | | By chemotherapy status | |
|---------------------------------|-----------------|------------------|-----------------|-----------------|------------------------|-----------------|
| | Mean \pm SD | Median (min-max) | Male (n = 60) | Female (n = 90) | Yes (n = 64) | No (n = 86) |
| | | | Mean \pm SD | Mean \pm SD | Mean \pm SD | Mean \pm SD |
| <i>Physical Symptoms</i> | 6.49 \pm 2.47 | 6.67 (0.67-10.0) | 6.84 \pm 2.35 | 6.27 \pm 2.53 | 6.73 \pm 2.40 | 6.33 (2.52) |
| <i>Physical Well-Being</i> | 5.73 \pm 2.21 | 5.50 (0.00-10.0) | 5.50 \pm 1.86 | 5.89 \pm 2.42 | 5.44 \pm 1.76 | 5.95 \pm 2.48 |
| <i>Psychological Well-Being</i> | 5.09 \pm 2.41 | 5.00 (0.00-10.0) | 4.87 \pm 2.22 | 5.24 \pm 2.53 | 4.54 \pm 2.04 | 5.50 \pm 2.59 |
| <i>Existential Well-Being</i> | 7.69 \pm 1.66 | 7.92 (1.33-10.0) | 7.96 \pm 1.55 | 7.52 \pm 1.72 | 8.13 \pm 1.47 | 7.37 \pm 1.73 |
| <i>Support Issues</i> | 8.68 \pm 1.80 | 9.50 (1.00-10.0) | 6.84 \pm 2.35 | 8.58 \pm 1.86 | 9.16 \pm 1.33 | 6.33 \pm 2.52 |
| <i>Total MMQoL Score</i> | 6.74 \pm 1.39 | 6.00 (1.20-9.65) | 6.80 \pm 1.20 | 6.70 \pm 1.51 | 6.80 \pm 0.99 | 6.70 \pm 1.63 |
| HADS-A | 6.29 \pm 4.19 | 6.00 (0.00-19.0) | 6.05 \pm 4.15 | 6.44 \pm 4.23 | 6.02 \pm 3.95 | 6.49 \pm 4.37 |
| HADS-D | 5.91 \pm 4.31 | 5.00 (0.00-19.0) | 6.25 \pm 3.53 | 5.69 \pm 4.76 | 7.53 \pm 3.65 | 4.71 \pm 4.38 |

Table 4: Relationships between anxiety and depression with HRQoL.

| MMQoL Domain | Hospital Anxiety and Depression Scale | | | |
|---------------------------------|---------------------------------------|----------|----------------|----------|
| | Anxiety (r) | p value* | Depression (r) | p value* |
| <i>Physical Symptoms</i> | - 0.335 | < 0.001 | - 0.205 | 0.012 |
| <i>Physical Well-Being</i> | - 0.344 | < 0.001 | - 0.296 | < 0.001 |
| <i>Psychological Well-Being</i> | - 0.526 | < 0.001 | - 0.464 | < 0.001 |
| <i>Existential Well-Being</i> | - 0.336 | < 0.001 | - 0.195 | 0.017 |
| <i>Supportive Issues</i> | - 0.334 | < 0.001 | - 0.215 | 0.008 |
| <i>Total MMQoL Score</i> | - 0.578 | < 0.001 | - 0.430 | < 0.001 |

The correlation between domains of MMQoL and HADS were shown in Table 4. HADS domains were found to have weak to moderate statistically significant negative relationships with all MMQoL domains. In general, the correlation coefficient for HADS-A vs. MMQoL were higher than HADS-D. The HADS-A had the strongest correlation with *Total MMQoL Score* ($r = -0.578$) and *Psychological Well-Being* ($r = -0.526$).

Multiple regression analysis was employed to determine if symptoms of anxiety and depression or age could contribute to the HRQoL among the cancer sufferers. The dependant variable was the *Total MMQoL Score* while HADS-A, HADS-D and age were the independent variables used in the regression model. No violation of regression assumption was identified. The total variance of *Total MMQoL Score* explained by HADS-A was 33.4%, $F(1,148) = 74.21$. Together both subscales of HADS

accounted for 35.5% of HRQoL variance, $F(1, 147) = 40.53, p < 0.05$. In the final regression model, only HADS-A ($p < 0.001$), and HADS-D ($p < 0.05$) were statistically significant in predicting overall HRQoL (Table 5). Additionally, HADS-A (beta = -0.486) produced the strongest contribution in explaining the variance of *Total MMQoL Score*. Multiple R for the relationship

between independent variables and the dependents variables included in the analysis was 0.596, which would be characterised as moderate. The beta coefficient of both independent variables implied that there was negative but weak relationship, indicating that low anxiety and depression were associated with better HRQoL.

Table 5: Subset of predictors for HRQoL.

| Model | Predictor variable | Beta coefficient | p value | R | R-square | Adjusted R-square | F |
|-------|--------------------|------------------|---------|-------|----------|-------------------|-------|
| 1 | HADS-A | - 0.578 | < 0.001 | 0.578 | 0.334 | 0.329 | 74.21 |
| 2 | HADS-A | - 0.486 | < 0.001 | 0.596 | 0.355 | 0.347 | 40.53 |
| | HADS-D | - 0.173 | 0.028 | | | | |

Discussion

HRQoL is a significant concern for patients with cancer and its disruption is often related to psychological distress. Earlier screening and detection of anxiety and depression are deemed essential as these psychological co-morbidities would exert a negative impact on HRQoL if left unnoticed and untreated. Consequently, prompt treatment of anxiety and depression will also enhance cancer treatment outcomes. Based on the scores of HADS-D, the prevalence of depressive symptoms in our sample was almost similar with previous studies in which the prevalence rate ranged from 10% to 40% [31,32]. When compared to data from local studies, our cancer patients were relatively more anxious than depressed [33,34]. However, the proportion of anxiety and depressive symptoms in our sample was interestingly higher than those obtained from previous studies [33 -35]. Ironically, the prevalence of combined anxiety and depressive symptoms as determined by

HADS (HADS-subscales ≥ 8) was slightly lower than other samples [5,33,34].

The findings of this study also showed a gender difference in the prevalence of anxiety symptom. The female patients in our sample were generally more depressed and more anxious compared to male patients. An overall high percentage of anxiety cases, compared to depression were also demonstrated. In a former prospective study of ovarian cancer patients, there was a significant initial psychomorbidity, with clinical anxiety at 38% and depression at 33% [36]. Although anxiety is often present in oncology patients compared to depression but the literature about anxiety symptom is not as widespread as compared to depression [5]. Our results also supported several former studies. Women with lymphoma had a tendency to be more depressed and were more anxious than men with similar cancer [32]. While Pettingale, Burgess, and Greer (1987) also discovered that women were more anxious than men at 1 year follow-up

in a study on 168 cancer patients with either lymphoma or breast cancer. In addition, females were also possessed a higher rate of psychological symptoms than men [37,38].

Understandably, depression and anxiety represented the most common forms of psychiatric disorders among this cohort especially for those who underwent chemotherapy. In our study, we also found that more than 50% of the patients who underwent chemotherapy were depressed. The results reflect that screening of mental health in cancer patients who undergoing adjuvant therapy should be routinely emphasised. Patients with chemotherapy treatment were more likely to be depressed either due to the disease or by its treatment [39]. Furthermore, it has been well-known that the chemotherapy treatment is an intense procedure often associated with a number of debilitating side-effects such as alopecia, oral mucositis, anemic, lowered immune system, appetite loss and weight loss which could provoke mood disorders [16]. According to Takahashi et al. (2008), treatment-related symptoms are major stressors in cancer patients who undergo chemotherapy and of all symptoms, both anxiety and depressive symptoms are the most prevalent in cancer patients. In addition, anxiety and depression symptoms in cancer patients had been similarly examined and significant associations were found with chemotherapy [40,41]. These previous findings firmly supported our study outcomes.

In cancer care, HRQoL and psychological well-being are important aspects to evaluate the effectiveness of patient management and disease treatments. Patient needs and expectation during their limited survival time can be enhanced by investigating their HRQoL. Generally, majority of the cancer patients in this study rated their HRQoL

reasonably well. Our findings showed that negative significant relationships were observed between overall domains score of HADS and MMQoL. Patients with anxiety and depression clearly experienced poorer HRQoL. These results were consistent to prior research which suggested that psychological disorders could have profound adverse effects on the *Psychosocial Well-Being* and the HRQoL of cancer patients especially during the cancer treatments [25,42,43]. The HRQoL outcomes in the present samples were also comparable to the results of a recent study which was conducted in Israel by Bentur and Resnizky (2005). They also discovered that psychological symptoms could elicit significant adverse effects on the HRQoL of cancer patients and the *Psychological Well-Being* domain had an independent effect on overall HRQoL of patients in Israel, as in other countries [43]. Nonetheless, a Hong Kong study conversely reported that anxiety did not negatively affect HRQoL of breast cancer respondents [39].

Physical distress and stage of disease have been shown to be consistent predictors HRQoL in patients with cancer but the relationship between disease burden and psychological distress could be generated by several individual and social factors including age, socioeconomic background, attachment security and spiritual well-being [44,45].

Overall, the results in our regression models revealed that anxiety and depressive symptoms can predict the overall HRQoL scores. These results were in parallel with prior studies that discovered significant associations between HRQoL and psychosocial variables among oncology patients [21,44,46]. Nonetheless, age did not contribute to HRQoL status in our cohort suggesting that it may play a limited role in

predicting HRQoL in our sample patients. Similarly, a study involved prostate cancer patients also elicited the same outcome [47]. In contrast, Gupta, Lis and Grutsch (2007), discovered that older age patients would have better HRQoL status compared to younger cancer sufferers [48]. Age may not predict HRQoL because our sample did not possess an even distribution of age ranges. Furthermore, age did not necessarily differentiate the prevalence of anxiety and depression as well as the level of HRQoL among patients with cancer [49].

There were a few limitations of this study. All the recruited patients were not highly educated, earning low income, and mostly came from a single geographic area. Therefore, it may not be possible to generalise the findings to other patients with different demography. Anxiety and depression are inter-related and co-existence of both disorders is common in general population and also among patients with cancer. Psychiatric diagnostic interview was not applied in this research which would have strengthened the diagnosis. However, if all patients received diagnostic interview, this would have placed an unrealistic burden both on the patients and on the clinical personnels. Instead, in many clinical settings, the screening process is frequently used involving initially self-report scales followed by the diagnostic interview [50]. Nevertheless, HADS has been shown to be a valid and reliable screening instrument in large series of cancer patients and even in the normal population. Most investigators had also interpreted HADS as a bidimensional instrument [51]. The MMQoL instrument was not intended, though, to explain the reasons for high or low HRQoL scores in the scales. We acknowledged that understanding the reasons behind HRQoL scores required a more in-depth qualitative discussion with the specific patients. This

study has nevertheless shed some insight into the anxiety and depression status of cancer patients in relation to HRQoL in the Terengganu residents.

Living with cancer brings many challenges in life, particularly the experience of the existential dilemma of pain, psychological suffering, and potentially short survival time. All resources including psychological resources that encourage healing, adjustment and a better HRQoL for the patients should be provided in the clinical arena. A broad range of services such as emotional, nutritional, genetic and financial counselling, steering patients and their families to institutional and community resources are also important psychosocial support elements that should not be neglected for a better psychological well-being and HRQoL of cancer patients [13,52].

Conclusion

In conclusion, our study confirmed the findings of previous research with respect to moderate prevalence of anxiety and depression in cancer patients. Female cancer patients and those with chemotherapy treatments were comparatively more depressed. It was further revealed that anxiety and depression had a significant and concerning association with impairment of HRQoL in our cancer patients. Hence, anxiety and depressive symptoms play an essential role in predicting HRQoL of cancer patients. This study suggested that if anxiety and depression are well identified it may somehow reduce psychological suffering and improve HRQoL among oncology patients. Future longitudinal studies that aim to investigate the associations and reasons for the diminished emotional disorders especially anxiety, depression and HRQoL outcomes should be warranted as specific treatments interventions targeting anxiety

and depression and aiming to enhance patients' HRQoL could be evaluated.

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