The Relationship Between Emotional Functioning of the EORTC QLQ-C30 and A Measure of Anxiety and Depression (HADS) in Cancer Patients

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Abstract

Objectives: In order to reduce suffering in cancer patients from answering different questionnaires, this study aimed to explore whether the emotional functioning (derived from subscale of the European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire-EORTC QLQ-C30) could quantify anxiety and depression in patients with different carcinomas.
Methods: Sample of patients with gastrointestinal cancer attending to Tehran Cancer Institute were studied. Patients were asked to complete two questionnaires: the emotional functioning (EF-derived from the EORTC QLQ-C30) and the hospital anxiety and depression scale (HADS). The Pearson's correlation coefficient (r) and logistic regression analyses were performed in order to examine the association between emotional functioning (EF), anxiety, and depression.
Results: In total 137 patients with gastrointestinal cancer were included in the study. The mean age of patients was 54.6 (SD = 13.8) years old; most were married (87%), male (55.5%), and without any normal education (55.5%). The mean emotional functioning score was 69.3 (SD = 27.3) and it was 7.7 (SD = 4.5) for anxiety and 8.5 (SD = 3.9) for depression. Significant negative correlations were found between EF subscale of the EORTC QLQ-C30 and both subscales of the HADS (Anxiety: r = -0.62, P < 0.0001; Depression: r = -0.54, P < 0.0001). The results obtained from logistic regression analysis showed strong associations between emotional functioning, anxiety, and depression (odds ratio for anxiety: 0.94, 95%; CI: 0.92 - 0.96, P < 0.0001; odds ratio for depression: 0.96, 95%; CI: 0.94 - 0.98; P < 0.0001). No other variables studied showed significant results.
Conclusions: The findings demonstrated that emotional functioning subscale of the EORTC QLQ-C30 covers both anxiety and depression. Indeed it is robust to use emotional functioning subscale to assess psychological distress in cancer patients.

Keywords: Gastrointestinal Cancer, Anxiety, Depression, Emotional Function, EORTC QLQ-C30

1. Background

Cancer diagnosis and side effects of its treatment influence the quality of life to a great extent. Despite progress in the treatment of cancer, patients often experience pain and emotional distress (1-3). Therefore, the assessment of quality of life in cancer patients is important issue either during treatment or at post treatment period. Collecting quality of life information in cancer clinical trials or in research settings is a usual practice. Since early 1990's a number of self-reported questionnaires have been developed to assess the quality of life in cancer patients (4, 5). These were either general core questionnaires for any cancer patients or for site-specific like lung cancer-specific or breast cancer-specific questionnaires (6). One of the most popular instruments used with cancer patients is the European Organization for Research and Treatment of Cancer (EORTC QOL-C30) that has received growing attention in research settings, outcome studies, and clinical settings (7).

The EORTC QLQ-C30 contains 30 questions and covers different aspects of quality of life (8) including physical, role, emotional, cognitive and social functioning, global quality of life, and measures of symptoms such as fatigue, pain, and nausea/vomiting. QLQ-C30 is the most used quality of life questionnaire for cancer patients worldwide (9). However, in addition to the generic, cancer-specific, and cancer site-specific instruments, there are several psychological measures such as the hospital anxiety and depres-

sion scale (HADS), which are usually used in order to assess psychological well being in cancer patients ([10], [11]). The HADS is a screening instrument and measures anxiety (HADS-A) and depression (HADS-D) with cut-off values suggestive of mood disorders ([12], [13]).

There were few studies that directly tested the relationship between emotional functioning subscale (EF) of the EORTC QLQ-C30 and the HADS. Skarstein et al. ([14]) in a study among Norwegian cancer patients showed that the relationship between EF and depression (HADS-D) was weaker than the anxiety score (HADS-A). They suggested that if psychological distress is the main objective of interest in screening studies among cancer patients, then there might need to use a questionnaire for the assessment of depression. In a validation study, it was indicated that there were significant associations between HADS-A (r = -0.67), HADS-D (r = -0.63), and EF dimension ([15]).

Diagnosis and treatment of cancer can be very stressful, therefore, due to the emotional burden among cancer patients, asking them to fill in several different questionnaires in busy oncology settings can impose additional burdens on them. On the other hand, asking many different questions from the patients while they need peace and calm is not ethical behavior. Since cancer patients are at high risk for emotional distress ([16]), we could not leave them without careful examination. Thus it is argued that we could use short and relatively comprehensive questionnaires in order to do both careful examinations without imposing extra burdens to them. For instance, if we use the EORTC-QLQ-C30 which includes questions about measures of psychological functioning then there is no need to use the HADS or if we use the HADS there is no need to use a similar questionnaire that measures anxiety and depression.

2. Objectives

Therefore, in order to reduce the suffering of patients from answering several different questionnaires, this study was conducted to examine whether emotional functioning (a subscale of the EORTC QLQ-C30) could be reflective of anxiety and depression measurement in cancer patients. It was hoped that the study could contribute to the existing knowledge on the topic and be of any help to cancer patients.

3. Methods

3.1. Design and Data Collection

This was a cross-sectional study of emotional status in patients with a confirmed diagnosis of gastrointestinal cancer attending to Cancer Institute of Tehran University of Medical Sciences. First, we obtained informed consent

from the patients, then they were interviewed and then we administered the study questionnaires. We also collected data on demographic characteristics and clinical information such as recording of age, gender, and educational status. Clinical information was extracted from case records. Patients with cognitive problems and who were unable to participate in the interview were excluded.

3.2. Instruments

1. Anxiety and depression were assessed using the hospital anxiety and depression scale (HADS). The HADS contains 14 questions and includes two subscales: anxiety and depression. Each item on either subscale is rated on four-point Likert categories (0 to 3) giving maximum scores of 21 for anxiety and depression. According to Zigmond and Snaith ([10]), the patients can be grouped as follows: 0 - 7: normal; 8 - 10: borderline; and 11 - 21: suspected cases. The Iranian version of the HADS proved that it has acceptable psychometric properties for measuring psychological distress ([15]).

2. Emotional functioning was measured using the EORTC QLQ-C30 subscale which contains 30 items. Seventeen items are related to patients' on functioning and global quality of life and the remaining 13 items are related to disease and treatment symptoms ([7]). This questionnaire has been translated and validated for use by Iranian patients and its psychometric properties have been well documented ([17]). Emotional functioning contains 4 items and each item is rated on a four-point scale (1: not at all, 2: a little, 3: quite a bit, 4: very much). Score of the subscale ranges from 0 to 100 where the higher values indicate better emotional functioning ([18]).

3.3. Statistical Analysis

Descriptive statistics were used to explore the data. Correlation between the HADS and the emotional functioning were assessed by the Pearson's correlation coefficient (r). Logistic regression analysis was performed to examine association between emotional functioning, anxiety, and depression. For the purpose of the analysis relative to cut-off points for anxiety and depression scores, patients were divided into two groups: normal and probable cases ([10]). Data were analyzed using the SPSS software version 13.0.

4. Results

4.1. Patients' Characteristics

In all 137 patients with gastrointestinal cancer were entered into the study. The mean age of patients was 54.6 (SD = 13.8) years old; most patients were male (55.5%) and without formal education (55.5%). The clinical and demographic characteristics of patients are shown in Table 1.

Table 1. Clinical and Demographic Characteristics and Mean Scores for HADS-A, HADS-D, and Emotional Functioning of QLQ C30[a]

	All (N = 137)	HADS-A[b]	HADS-D[b]	EF[c]
Age	54.6 ± 13.8	7.7 ± 4.5	8.5 ± 3.9	69.3 ± 27.3
Gender				
Male	76 (55.5)	7.14 ± 4.7	8.4 ± 4.1	67.6 ± 22.9
Female	61 (44.5)	8.4 ± 4.2	8.6 ± 3.7	60.3 ± 21.2
Marital status				
Single	11 (8)	6.9 ± 2.9	6 ± 2.9	62.1 ± 12.5
Married	119 (87)	7.7 ± 4.6	8.6 ± 3.9	64.5 ± 23.4
Widowed	7 (5)	8.1 ± 5.1	10.5 ± 3.1	65.4 ± 17.6
Educational status				
Illiterate	76 (55.5)	7.2 ± 4.4	8.6 ± 3.6	66.6 ± 21.6
Primary	40 (29.2)	7.5 ± 4.6	7.5 ± 3.7	64.3 ± 21.9
Secondary	12 (8.8)	10.3 ± 4.9	10.1 ± 5.9	49.3 ± 30
College/university	9 (6.6)	9.4 ± 3.2	9.1 ± 3.4	65.7 ± 12.8

[a] Values are expressed as mean ± SD or No. (%).
[b] Anxiety and depression scores derived from the hospital anxiety and depression scale. Higher score indicates a greater symptom (min: 0, max: 21).
[c] The higher values indicate a higher level of emotional functioning (min: 0, max: 100)

4.2. Anxiety, Depression, and Emotional Functioning

The mean emotional functioning score was 69.3 (SD = 27.3) out of 100. The mean anxiety score was 7.7 (SD = 4.5). The mean depression score was 8.5 (SD = 3.9). Overall 26% and 24% of patients had high scored on anxiety and depression, respectively. Patients' scores for the HADS and emotional functioning are shown in Table 2.

Table 2. The HADS and Emotional Functioning (the EORTC QLQ C30)[a]

	Normal (0 - 7)	Borderline (8 - 10)	Case (11 - 21)
HADS-A	71 (51.8)	30 (21.9)	36 (26.3)
EF score	75.1 ± 17.3	58.8 ± 18.1	47.9 ± 23
HADS-A score	4.1 ± 2.3	9.0 ± 0.78	13.5 ± 2.64
HADS-D	57 (41.6)	44 (32.1)	34 (24.8)
EF score	72.5 ± 16.9	68.3 ± 18.3	44.1 ± 23.1
HADS-D score	5.2 ± 1.4	9 ± 0.84	13.7 ± 2.8

[a] Values are expressed as mean ± SD or No. (%).

Significant correlations were found for most items of the HADS and items for the EF dimension. The results are presented in Table 3. The highest correlation coefficients were observed for the correlations between HADS-A and Q21 (Did you feel tense?) and Q22 (Did you worry?). In addition, significant negative correlations observed for the EF and both subscales of the HADS scores (anxiety: r = -0.62, P < 0.0001; depression: r = -0.54, P < 0.0001).

Finally the results obtained from logistic regression analysis showed strong associations between emotional

Table 3. Correlation Between Anxiety and Depression (HADS) and Emotional Functioning (the EORTC QLQ C30)[a]

	Q21	Q22	Q23	Q24
HADS-A	0.57[b]	0.59[b]	0.42[b]	0.27[b]
Tense/Wound up	0.51[b]	0.3[b]	0.24[b]	0.12
Frightened feeling	0.42[b]	0.5[b]	0.33[b]	0.25[b]
Worries	0.5[b]	0.54[b]	0.32[b]	0.2[b]
Relaxed	0.21[c]	0.35[b]	0.31[b]	0.24[b]
Butterflies	0.5[b]	0.52[b]	0.28[b]	0.23[b]
Restless	0.28[b]	0.43[b]	0.4[b]	0.26[b]
Panic	0.43[b]	0.28[b]	0.22[b]	0.06
HADS-D	0.41[b]	0.42[b]	0.44[b]	0.35[b]
Enjoy things	0.23[b]	0.22[b]	0.3[b]	0.08
Laugh/Funny side	0.38[b]	0.42[b]	0.35[b]	0.29[b]
Cheerful	0.22[b]	0.29[b]	0.24[b]	0.27[b]
Slowed down	0.22[b]	0.19[c]	0.25[b]	0.2[c]
Appearance	0.22[c]	0.31[b]	0.33[b]	0.3[b]
Enjoyment	0.32[b]	0.25[b]	0.15	0.2[c]
Radio//TV	0.26[b]	0.18[c]	0.29[b]	0.3[b]

[a] Q21: Did you feel tense? Q22: Did you worry? Q23: Did you feel irritable? Q24: Did you feel depressed?
[b] P < 0.01
[c] P < 0.05

functioning and anxiety (OR = 0.94, 95%; CI: 0.92 - 0.96; P < 0.0001) and depression (OR = 0.96, 95%; CI: 0.94 - 0.98,

P < 0.0001). There was no significant association between anxiety, depression, and other independent variables. The results are presented in Table 4.

Table 4. The Results Obtained from Regression Analysis in Predicting HADS-A Adjusted for Age, Gender, Marital Status, and Education (N = 137)

	OR	95% CI	P Value
HADS-A			
Age	0.98	0.94 - 1.01	0.47
Education	1.1	0.99 - 1.2	0.59
Gender			
Female	1 (ref)		
Male	0.87	0.37 - 2.4	0.76
Marital status			
Single	1 (ref)		
Married	0.19	0.01 - 2.24	0.18
Widowed	0.47	0.08 - 2.7	0.4
Emotional functioning (EF)	0.94	0.92 - 0.96	< 0.0001
HADS-D			
Age	1.01	0.97 1.04	0.51
Education	1.02	0.93 - 1.12	0.56
Gender			
Female	1 (ref)		
Male	0.9	0.41 - 1.98	0.81
Marital status			
Single	1 (ref)		
Married	0.12	0.01 - 1.49	0.1
Widowed	0.56	0.09 - 3.55	0.54
Emotional functioning (EF)	0.96	0.94 - 0.98	< 0.0001

5. Discussion

The results of the current study provided evidence for association between anxiety, depression subscales of the HADS, and emotional functioning (EF) of the EORTC QLQ C30. In other words if cancer patients have high score on emotional functioning they are very likely to poses satisfactory psychological well-being and if they have low score then they might be subject to psychological distress including anxiety and depression.

In the present study, we measured anxiety and depression using the HADS. It showed that it is an acceptable test for measuring such symptoms in cancer patients (11). The Persian version of the HADS is currently used among Iranian patients with cancer, but it seems that if we use the EOPRTC QLQ-C30 and its emotional functioning it would be enough as it mirrors such psychological

distresses (19). There are very few studies that directly examined the agreement between the HADS and the (EORTC QLQ-C30). Grassi et al. (8) conducted a study on depressive symptoms and quality of life in home-care-assisted cancer patients and they found that there was a significant correlation between HADS-D and the EF (r = 0.36; P < 0.01). Similarly, a study of lung cancer patients by Montazeri et al. (20) showed that there were significant associations between global quality of life as measured by the EORTC QLQ-C30 and both anxiety and depression as measured by the HADS. In fact, these relationships indicate that the emotional functioning of EORTC QLQ-C30 sufficiently screens for anxiety and depression in cancer patients.

The present study had some limitations. This was a descriptive study and it would be useful to repeat this study using objective information like clinical examination of patients. In addition, these findings raise questions about other dimensions of quality of life that may be relevant to anxiety and depression and these were not assessed in this study.

5.1. Conclusions

The findings demonstrated that emotional functioning subscale of the EORTC QLQ-C30 covers both anxiety and depression. In general, it makes sense to use emotional functioning to measure psychological distress in cancer patients.

Patient Consent: All participants were informed about the aims and methods of the study. Also informed consents obtained from all participants prior to interview.

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