

Health-related quality of life among patients with colorectal cancer

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Abstract

Background: Up to 35% of cancer patients have clinically significant levels of psychological distress during their treatment. Accordingly, better understanding of health-related quality of life and its predictors will help oncology nurses plan appropriate interventions to improve health-related quality of life.

Aims: This study was conducted to investigate the relationship between hope, depression and anxiety and health-related quality of life among Jordanian cancer patients during their treatment period.

Methods: Cross-sectional descriptive correlational design was conducted using the Hospital Anxiety and Depression Scale, Herth Hope Index and Functional Assessment of Cancer Therapy-Colorectal surveys.

Results: 260 Jordanian patients with cancer from three Jordanian hospitals completed the study survey. The bivariate analysis indicated significant positive relationships between hope and quality of life ($r = .57, p < .0001$). A significant negative relationship was found between anxiety and depression and quality of life ($r = -.76, p < .0001$). A multiple regression analysis indicated that hope, Hospital Anxiety and Depression Scale and time since diagnosis were predictors of quality of life, and explained 66% of the variance in the quality of life for this sample.

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Conclusions: The assessment of psychosocial elements including hope, depression, anxiety, and quality of life should be a part of daily nurse-caring behaviours and practices. Implement education programmes to increase nurses' competencies in the psychosocial assessment are recommended.

Keywords

cancer, HADS, hope, quality of life, colorectal

Introduction

Cancer diagnosis is a traumatic event that can have a significant emotional impact on patients and their families (Girgis et al., 2012). Patients undergoing treatment for cancer may experience severe symptoms that affect social and physical functioning, disrupt family life and even lead to depression, all of which may affect health-related quality of life (HR-QOL) (Hubbard et al., 2010; Marventano et al., 2013). Colorectal cancer (CRC) is the second leading cause of cancer-related mortality and the third most prevalent malignant disease affecting men and women, almost equally (Haraldsdottir et al., 2014; Marley & Nan, 2016; Siegel et al., 2014).

Colorectal cancer and its treatment can have an adverse effect on social functioning, including on work and overall life, relationships with friends, relatives and partners, as well as other social activities and interests (Caravati-Jouveanceaux et al., 2011). In addition, patients may experience a wide range of cancer-related stressors, such as uncertainty about its recurrence and their recovery, and/or the psychological ramifications/consequences (such as depression, anxiety and stress) related to diagnosis and treatment (Mosher et al., 2017; Pereira et al., 2012; Weaver et al., 2012). With the development of treatment modalities and medical technologies, for many sufferers cancer has shifted from being fatal in the short term to often being a chronic disease requiring long-term palliative treatment (Weaver et al., 2012).

As a result of the complications and reactions to the diagnosis of and treatment for cancer, patients might experience a diminished HR-QOL in relation to their social, emotional, physical, spiritual and/or psychological wellbeing (Breedveld-Peters et al., 2018; Cameron & Waterworth, 2014). Medical and other health professionals have recognised the importance of measuring HR-QOL as a crucial element in assessing the patient's health, response to treatment and increasing survival role (Fayers & Machin, 2013). The term HR-QOL is frequently used to focus on the outcomes of clinical treatment, care plans and related practice strategies, for example, physical, emotional and role functioning, physical symptoms and drug toxicity, social wellbeing, functional ability, life satisfaction and somatic sensation (Yin et al., 2016).

Hope is considered one of the most important variables in healing, coping and enhancing QOL during periods of stress and loss. In addition, the presence of hope has been shown to improve patients' physical and mental wellbeing (Fischer et al., 2018). Further, hope has been studied in relationship to patient characteristics, and different types of acute and chronic diseases, mostly in cancer patients (Fischer et al., 2018). Hope was identified as an antecedent to coping and perceived control over illness among patients with cancer (Fischer et al., 2018). For example, a study conducted to investigate the relationship between hope and coping among 159 cancer patients showed there was a positive

relationship between hope and optimism, hope and self-reliance and hope and positive coping styles (Zhang et al., 2010).

The diagnosis of, and treatment for, cancer can cause psychological distress, specifically depression and anxiety (Sharp et al., 2013). Depending on the study, the prevalence of depression and anxiety in patients with cancer appears to range from 0 to 49% (Mitchell et al., 2011; Mols et al., 2018). This variation in the findings may be related to the different types of cancer and the different treatment modalities under investigation (Nordin et al., 2001). Similar findings were identified in a recent study to discover the predictors and risk factors for depression among African American cancer patients (Agarwal et al., 2010). The results of this single-centre study showed a prevalence of depression of 27.2% among the 283 patients in the sample. The risk factors included: age (younger patients were most likely to experience depression); economic and social problems (their inability to find a job); symptoms and adverse effects of treatment; and living with the family (family support worked as a protective element from depression) (Agarwal et al., 2010).

The extensive literature search reveals a paucity of research that discussed QOL, hope, anxiety and depression among CRC patients in a single study and a lack of studies that explored the phenomena among the Jordanian population. In developing countries such as Jordan, there are limited studies about QOL and its predictors among patients with CRC. Significantly, the effect of CRC diagnosis and treatment on patients' QOL and psychosocial aspects (hope, anxiety and depression) is still poorly understood. Therefore, the current study was conducted to increase our understanding of QOL and its predictors among CRC during the patients' treatment period. Importantly, by identifying the factors that might influence patients' QOL, this study will provide researchers, nurses and other health professionals with needed information that will enable them to develop culturally appropriate interventions that lessen the impact of the most distressing factors while supporting those that promote a better QOL. Additionally, the results of the current study might be utilised by educators to improve undergraduate nursing programmes and specialist postgraduate oncology nursing programmes, to better prepare nurses for their role in assessing psychosocial wellbeing in patients with cancer, in addition to planning appropriate intervention programmes for these patients. Thus, this study was conducted to investigate the relationship between hope, depression and anxiety and HR-QOL among Jordanian CRC patients.

Materials and Methods

Design

A predictive correlational design was used to describe the interrelationships of hope, depression and anxiety and QOL.

Ethical consideration: This research was approved by Ministry of Health and College of Nursing Ethics Committees at (AlZaytoonah) University (13/05/2508). All the ethical principles of the Belmont and Nuremberg report were strictly followed in the current study. Permission to use the study surveys was obtained from the originators of the tools.

Data collection

A package comprising an information sheet, consent form and survey instrument was given to each eligible participant. Eligible participants met the following inclusion criteria: (1) able to read and speak Arabic; (2) have been diagnosed with CRC; and (3) able to give their

consent. Consenting participants were asked to complete the coded questionnaire. Data were collected from three main governmental hospitals in Jordan. Three main scales were used: Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983); Herth Hope Index (HHI); and Functional Assessment of Cancer Therapy-Colorectal (FACT-C). A demographical sheet was also used to collect data about the participants' characteristics.

Study measures

- (1) A demographic sheet including participants' age, gender, marital status and income.
- (2) FACT-C was developed by Cella et al. (1993) to measure general QOL. The survey encompasses four subscales: (1) physical wellbeing; (2) social-family wellbeing; (3) functional wellbeing; and (4) emotional wellbeing. The subscales consist of seven items, except the last subscale, which has six. Each item has a five-point Likert scale ranging from 0 'not at all' to 4 'very much'. Total score is the sum of the four subscale scores and has a possible range of 0–108 points, with higher scores indicating higher levels of QOL (Webster et al., 2003). Reliability and validity were established for the test and it showed good internal consistency reliability (≥ 0.7) (Yost et al., 2013).
- (3) The HHI was developed by Herth (1992) to measure hope with a scale consisting of 12 items. Each item has a five-point Likert scale ranging from 0 'strongly disagree' to 4 'strongly agree'. The total is the sum of the 12-item scores and has a possible range of 12–48 points, with higher scores indicating higher levels of hope. The total score ranges from 12 to 48, where the higher scores indicate a great level of hope. Reliability and validity were established for the test. Cronbach's α was 0.84 and the test-retest reliability was 0.64 (Ripamonti et al., 2012).
- (4) The HADS was developed by Zigmond & Snaith (1983) to detect anxiety and depression among patients with medical illnesses. The scale consists of two separate sections; one measures anxiety and the other measures depression. Each part consists of seven items, which make up of 14 items measured on a four-point Likert scale. The anxiety level is rated from 0–28, where a higher score indicates a higher level, which is similar to depression, where higher scores also indicates greater levels of depression. The HADS demonstrated high internal consistency (Cronbach's α was 0.88 (0.83 for anxiety and 0.84 for depression)), stability (test-retest was 0.94) and high concurrent validity (Michopoulos et al., 2008).

The surveys were translated into Arabic. The translation was carried out in accordance with World Health Organization (WHO) guidelines (WHO, 2017). The process involved five important steps. Forward translation from English to Arabic was done by three native Arabic speakers (two living in Jordan and one living in the United States). All translators were highly qualified in medical and/or health concepts and possessed a PhD degree in nursing. Then, reconciliation of forward translations was conducted by one native Arabic speaker, who was familiar with medical and/or health concepts, was not involved in the forward translation and was PhD qualified. Subsequently, back translation of the reconciled version from Arabic to English was performed by a native English speaker, who was fluent in Arabic, not involved in the previous steps, knowledgeable of medical and/or health concepts and was PhD qualified. Comparison of the translated version with the original English version was then performed. The translated Arabic surveys were piloted on 20 patients to examine the internal

consistency of the study's scales (HHI, HADS and FACT-C). Internal consistency of each scale was measured using Cronbach's α . Table 1 represents these results. Then reliability of the instrument was tested again (Table 2 represents the results).

Data analysis

Statistical Package of Social Sciences for Windows, version 23.0 was used to analyse the data. Descriptive statistics, including frequencies and percentages, were used to describe the sample characteristics in terms of demographics (age, marital status, gender) and disease-related conditions (regional metastasis, treatment modalities). Descriptive statistics using means and standard deviations were employed to describe age, income, time since diagnosis and FACT-C, HHI and HADS scales. Pearson's product-moment correlation coefficient (Pearson's r) was used to identify correlations between each of the independent variables and the dependent variable (QOL). Multiple regression (R^2) analysis using a model-building approach, as described by Hair et al. (2006), was undertaken to identify the predictors of QOL. The significance level was tested at $p \leq 0.05$. Cohen's formula (1988) was used to estimate the required sample size for the current study. A medium effect of correlations between hope, depression and anxiety, age, gender, marital status, income, time since diagnosis and QOL was used to guide the sample size calculation. A sample of 240 participants was estimated to achieve 80% power to detect an R -squared of 0.05 attributed to five independent variables by using Power Analysis and Sample Size software. Another popular method to estimate sample size to test/run multiple regression

Table 1. Reliability of the translated instruments ($N = 20$).

| Scale | Number of items | Cronbach's α (Arabic version) | Cronbach's α (original version) |
|--------|-----------------|---|---|
| HHI | 12 | 0.77 | 0.97 |
| HADS | 14 | 0.85 | 0.91 |
| FACT-C | 36 | 0.77 | 0.85 |

FACT-C: Functional Assessment of Cancer Therapy - Colorectal; HADS: Hospital Anxiety and Depression Scale; HHI: Herth Hope Index.

Table 2. Cronbach's α for the translated scales used in the study ($N=260$).

| Scale | Number of items | Cronbach's α (Arabic version) |
|--------|-----------------|---|
| HHI | 12 | 0.75 |
| HADS | 14 | 0.92 |
| FACT-C | 36 | 0.92 |

FACT-C: Functional Assessment of Cancer Therapy – Colorectal; HADS: Hospital Anxiety and Depression Scale; HHI: Herth Hope Index.

analysis is that the sample must include at least 15 participants per predictor variable (Reinard, 2006).

Results

A total of 320 patients who were diagnosed with CRC across three Jordanian hospitals were invited to participate. Of these, 260 patients completed the survey forms for a response rate of 81.25%.

The participants' ages ranged from 23 to 76 years, with a mean age of 51.9 years (SD 9.48); time since diagnosis ranged from 2 to 24 months, with a mean of 11.69 (SD 4.80); and patients' monthly income ranged from 120–1000 Jordanian Dinar (mean = 397.03, SD 138.10). In addition, 65.4% of the participants had no complications at the time of data collection and 96.9% participants had no regional metastasis. The majority (98.8%) were treated with different treatment modalities (a combination of chemotherapy and surgery).

The average of the FACT-C total scale score was 100.39 (SD 16.3). For this Jordanian sample, the results indicated that social/family wellbeing of QOL had the highest score (mean 23.4; SD 3.8), whereas emotional wellbeing of QOL had the lowest score (mean 16.2; SD 4.5). Table 3 details these results.

The results indicated that participants' total of hope level ranged from 24 to 46, with a mean of 37.5 (SD 3.9), with the higher scores indicating a greater level of hope. The highest percentage of participants agreed they had a positive outlook toward life (80.4%), and 81.5% of the participants could see possibilities in the midst of difficulties. The majority of participants (60.4%) had a faith that gave them comfort and nearly 60% could recall happy or joyful times. Nearly 70% of participants strongly agreed their life had value and worth. Over half (57.7%) of the participants believed each day had potential.

The results indicated that participants had mild depression, with a mean of 6.3 (SD 3.3) and mild anxiety, with a mean of 7.9 (SD 3.0); the total score of HADS ranged from 0 to 30, with a mean of 14.2 (SD 5.8). The score of 0 to seven for either subscale could be regarded as being in the normal range, a score of eight to 10 is moderate and a score of 11 or higher indicates a severe disorder (Snaith, 2003). The results also indicated that 83.1% of participants no longer enjoyed things as much as they used to, whereas 13.5% of participants reported that they enjoyed the things they used to enjoy, but only a little. In addition, 1.9% of the participants had lost interest in their appearance, and only 15.8% did not care as much as they should about their appearance. Moreover, 83.5% of the

Table 3. Range, mean and standard deviation of the FACT-C Domains (N=260).

| FACT-C domains | Minimum | Maximum | Mean | SD |
|--------------------------------|---------|---------|--------|-------|
| Physical wellbeing of QOL | 1 | 28 | 19.30 | 6.43 |
| Emotional wellbeing of QOL | 5 | 24 | 16.24 | 4.50 |
| Functional wellbeing of QOL | 3 | 28 | 21.98 | 4.62 |
| Social/family wellbeing of QOL | 6 | 28 | 23.43 | 3.78 |
| Additional concern of QOL | 11 | 30 | 19.44 | 3.42 |
| Total FACT-C score | 47 | 123 | 100.39 | 16.29 |

FACT-C: Functional Assessment of Cancer Therapy – Colorectal; QOL: quality of life.

participants were not able to laugh and see the funny side of things, whereas 13.5% said they could laugh and see the funny side, but not as much as previously. Furthermore, a minority of the participants had sudden feelings of panic (0.8%), and 14.6% quite often had sudden feelings of panic. Finally, 33.8% of the participants could sit at ease and feel relaxed.

There were significant positive relationships between hope, time since diagnosis and QOL. There was also a significant negative relationship between psychological distress (as measured by HADS) and total QOL, which accounted for 57.0% of the variance shared between these two variables. Moreover, there was no significant relationship between age, marital status, income and QOL. Finally, a significant negative relationship was found between gender and QOL; female patients had lower QOL than male patients. Table 4 details the results of the correlations.

A standard multiple regression (R^2) analysis was used to establish the relative contribution of the hypothesised predictors (hope, psychological distress (depression and anxiety), age, gender, marital status, income and time since diagnosis to QOL). First, statistical assumptions in relation to normality, linearity, heteroscedasticity and independence of residuals were assessed. Second, the independent variables, where there were significant correlations with QOL, were entered into an initial regression model. Third, the variables that were correlated in the initial regression model were only entered into the parsimonious regression model. In the current study, a preliminary regression analysis was undertaken; all the independent variables that were correlated with QOL in the bivariate level including hope, time since diagnosis, gender, psychological distress were entered in this model. The initial model showed that hope, psychological distress (depression and anxiety) and time since diagnosis predicted QOL among Jordanian CRC patients. Accordingly, these predictors were entered in the parsimonious regression model. The parsimonious regression model for QOL accounted for 66.3% of the variance, with $R^2=0.663$, adjusted $R^2=0.656$, $F(99.98, p<.0001)$. The results indicated there were positive relationships between hope, time since diagnosis and QOL ($b=0.70$ and 0.27 , respectively) and a negative relationship between psychological distress (depression and anxiety) and QOL ($b=-1.58$). Finally, the results from the parsimonious regression model indicated that hope, psychological distress (depression and anxiety) and time since diagnosis predicted QOL. The results showed that $R^2=.663$ (adjusted $R^2=.65$), $F(125.27, p<.0001)$. Table 5 details these results.

Table 4. Correlational analysis between hope, psychological distress (depression and anxiety), time since diagnosis, age, gender, marital status, income and QOL ($N=260$).

| Independent variable | <i>r</i> | <i>P</i> value |
|--|----------|----------------|
| Hope (HHI) | 0.57 | <.0001 |
| Psychological distress (depression and anxiety) (HADS) | -0.76 | <.0001 |
| Time since diagnosis | 0.16 | 0.009 |
| Age | 0.33 | 0.600 |
| Gender | -0.14 | 0.030 |
| Marital status | -0.04 | 0.57 |
| Income | 0.05 | 0.48 |

HADS: Hospital Anxiety and Depression Scale; HHI: Herth Hope Index; QOL: quality of life.

Table 5. Parsimonious regression model for QOL predictors ($N=260$).

| Predictor | Standardised coefficients beta | SE | B | P | 95.0 % CI interval | |
|---|--------------------------------------|------|-------|-------|--------------------|----------------|
| | | | | | Lower bound | Upper bound |
| Hope (HHI) | .17 | .18 | .70 | .0001 | 0.34 | 1.06 |
| Psychological distress (depression and anxiety), (HADS) | -.56 | .12 | -1.58 | .0001 | -1.82 | -1.34 |
| Time since diagnosis | 0.08 | 0.13 | 0.27 | 0.03 | 0.03 | 0.52 |
| Total R^2 0.66 | | | | | | |

CI: confidence interval; HADS: Hospital Anxiety and Depression Scale; HHI: Herth Hope Index.

Discussion

This study was conducted to investigate the relationship between hope, depression and anxiety and HR-QOL among Jordanian CRC patients. In the current study, participants showed a good result on the hope scale. Hope is considered a key contributing factor to improve patients' HR-QOL. That is, it enhances their ability to adjust to the disease and improves their self-esteem and ability to adapt to the loss of their former life and to their uncertain future (Fischer et al., 2018; Griggs & Walker, 2016). Additionally, hope increases patients' levels of perceived control over the crisis and promotes patients' psychological wellbeing and their ability to handle new and difficult situations, which reflects positively on life satisfaction and their HR-QOL (Jafari et al., 2010; Rustøen et al., 2010; Wnuk et al., 2012). Consequently, having a high level of hope motivates and increases the patients' possibilities in relation to them achieving their goals, to their continuing treatment and to fighting the challenges that arise as they develop their plans and perform the required tasks, such as follow-up treatment, clinic visits and maintaining a normal life. Therefore, nurses should promote interventions that are able to give patients hope.

The results of the current study showed the participants had a good QOL. Similar results were obtained by Rodriguez and colleagues in the United States (Rodriguez et al., 2015). This can be related to several factors. Physical status was identified in previous literature as a contributing factor (Rodriguez et al., 2015). From a Jordanian perspective, the existence of solid social support systems has helped patients who are in need. This is reflected in the social/family wellbeing sub-score as this was the highest calculated subdomain. The HR-QOL has a significant impact on patients' survival rates (Breadner et al., 2018). Furthermore, the results from the current study showed that participants' physical wellbeing score was above average. This means they can participate in daily and social activities and carry out their roles without limitations. These abilities will increase their QOL. Therefore, health team members in Jordan are required to maintain the current social support system and facilitate and establish programmes to enhance patients' physical activity. In this regard, as its score was the lowest among participants in the current study, nurses should also target emotional wellbeing through the development of culturally sensitive programmes and test their effectiveness.

Around one-third of the participants in the current study reported feelings of mild depression and anxiety. Previous research reported around 20% of cancer patients have

anxiety (Hong & Tian, 2014; Linden et al., 2012; Tel et al., 2011). A significant association was found between depression and on anxiety all the domains of HR-QOL among patients with cancer in the United States (Brown et al., 2010). Another study was conducted in Turkey to assess the relationship between depression and anxiety and HR-QOL among cancer patients (Alacacioglu et al., 2009, 2010). The results showed a negative relationship between HR-QOL and anxiety and depression. The results from the current study concur with Alacaciolu and colleagues' (2010) findings in determining that patients with psychological distress (namely depression and anxiety) experienced and reported lower scores of HR-QOL.

It appears that cancer patients in general and CRC patients in particular face and experience psychologically distressing feelings, resulting in depression and anxiety (Hong & Tian, 2014; Linden, et al., 2012; Tel, et al., 2011). Further, these reactions and feelings may have a negative outcome by delaying treatment plans and strategies; the treatment itself; the decision-making process; the patient's response to the treatment or complications; and the patients' overall HR-QOL domains (physical, emotional, social, sexual and psychological). The effects on patients' HR-QOL from psychological distress (depression and anxiety) can lead to a decline in cancer patients' HR-QOL at the time of the diagnosis and during the treatment/illness period (Janda et al., 2017). This might lead to the disruption of the treatment plan and the general management of the disease and related symptoms. There is a need to develop programmes and intervention that would alleviate patients with CRC depression and anxiety. Mindfulness-based therapy is a successful example of a way to alleviate anxiety and stress (Hofmann et al., 2010). There is a need to adopt such programmes in Jordanian hospitals.

Some limitations to this study were identified. The first was using a quantitative approach with a cross-sectional, correlational design. This could be a limitation in terms of the research outcomes, especially as the study did not focus on the causal effects of the relationships between hope, psychological distress and QOL. Thus, it was not possible to evaluate the causal relationship between the independent variables and the dependent variable. However, the researchers sought to provide an initial understanding of the explanatory variables that contribute to QOL in Jordanian CRC patients. The second limitation involved the way the study focused on one type of cancer, CRC. Consequently, the results may be unique and specific to this group of patients and so may not be generalisable to other cancer groups. However, CRC is the most common type of cancer among Jordanian cancer patients. However, the results from the present study have identified a number of psychosocial predictors of QOL at the time of diagnosis and during the illness period. However, due to time constraints, the study was unable to explain the impact of these factors on medical outcomes (such as physiological outcome, length of stay at hospital, survival rate and response to treatment). Thus, it is recommended that further research focus on these factors, along with their role as predictors of QOL. In addition, the results highlighted the importance of oncology nurses in assessing the psychosocial elements (such as hope, depression and anxiety) as a part of daily nurse-caring behaviours and practices. Additionally, oncology nurses should conduct intervention workshops, incorporating programmes to teach and enhance the patients' abilities and increase their level of hope.

Conclusion

The results of the current study showed that hope, depression and anxiety play significant roles in improving and diminishing patients' QOL during the treatment phase. Thus, health professionals should pay attention to the psychosocial aspects of treatment and physical

symptom management. The current study has been important in extending our understanding of the QOL of Jordanian CRC patients. The data and framework allowed for an investigation into the psychosocial predictors of QOL, at the time of diagnosis and during the active treatment period. In addition, the results identified the impact of CRC on the patients' QOL, as well as their lives. Although supporting prior research findings, the current findings underline the importance of these psychosocial factors on the patient's QOL. Importantly, the present study identified the importance of undertaking psychosocial assessments and interventions within daily nursing practice. The study also showed the essential role played by educating and preparing medical professionals and nurses with the skills and knowledge to enable them to assess and diagnose the psychosocial problems that exist among cancer patients. There appears to be a need to develop and utilise a psycho-educational programme to improve patients' QOL, and to prevent or minimise the impact of CRC diagnosis and treatment.

Key points for policy, practice and/or research

- Cancer diagnosis and treatment disrupts patients' lives and decreases their QOL.
- HR-QOL is a crucial element in assessing the patient's health, response to treatment and increase in survival rate.
- Hope, HAD and time since diagnosis were predictors of QOL.
- Treatment plans for patients with cancer should include psychosocial aspects in addition to physical symptom management.

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Declaration of conflicting interests

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Ethics statement

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