Association between cervical cancer-related anxiety and depression symptoms and health-related quality of life: A Moroccan cross-sectional study

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A R T I C L E   I N F O
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A B S T R A C T

Introduction: Health-related quality of life (HRQoL) of cervical cancer patients treated by Concurrent Chemo-radiation (CCRT) in Morocco is influenced by multiple concomitant factors that affect patients’ post-treatment physical and psychosocial well-being. Therefore, the assessment of post-treatment health related quality of life may help identify groups of patients and risk factors for future interventions for improving post-treatment quality of life.

Method: This study aimed at assessing HRQoL and its association to psychological distress of 103 cervical cancer patients treated with CCRT in Morocco. The assessment was performed using the EORTC-QLQ-C30 and the HADS questionnaires.

Results: Cervical cancer patients had diminished HRQoL for functional dimensions ("emotional functioning", "physical functioning" and "role functioning") with averages of 51.78, 54.17, and 58.74, respectively) and high level for symptomatic dimensions with mean scores of 58.90 for "Appetite loss", 38.83 for "financial difficulties", 45.31 for "insomnia", 45.42 for "fatigue", and 46.28 for "pain". The assessment of anxiety and depression symptoms showed that the majority of patients had high level of anxiety (62.1%), and depression (61.2%). Emotional functioning, fatigue and insomnia were the main predictors of anxiety disorders in women with cervical cancer. Lower emotional functioning and greater fatigue and insomnia contributed significantly to higher anxiety level.

Conclusions: HRQoL and psychological status of Moroccan cervical cancer patients undergoing CCRT were negatively affected. These findings suggest that future patient care policies should include strategies for improving HRQoL, mainly through psychological support and patient education as well as prevention or reduction treatment complications.

1. Introduction

Cancer is a major public health problem all over the world. According to the International Agency for Research on Cancer (IARC), 19.3 million new cancer cases were diagnosed and 10.0 million deaths are recorded worldwide in 2020. Cervical cancer is the fourth-ranked cancer among women worldwide with an estimated 604,000 new cases and 342,000 deaths in 2020. In Morocco, cervical cancer is the second most common cancer among females, after breast cancer, with 2165 new cases and 1199 deaths in 2020. Available therapy for cervical cancer led to improve survival rates. Treatment modalities of cervical cancer depend on different factors such as patient’s age, stage at diagnosis, and patient health status. Berraho et al. reported that Moroccan women are diagnosed with cervical cancer at the late stage. Indeed, 43.7% of cervical cancer patients in Morocco present at FIGO stage II and 38.1% at advanced stages (III and IV). Delay in diagnosis is one of

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2213-3984/© 2023 The Authors. Published by Elsevier B.V. on behalf of INDIACLLEN. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
the major causes of cancer-related mortality of Moroccan women. Assessment of Health-related Quality of Life (HRQoL) remains an essential element in evaluating the post-treatment health status of cervical cancer patients. In this context, the European Organization for Research and Treatment of Cancer (EORTC) has developed the Quality of Life Questionnaire-Core 30 (EORTC-QLQ-C30) instrument to evaluate patients’ health-related quality of life. The instrument includes 30 items for 5 functional scales (13 items), 9 symptom scales (15 items), and general health status (2 items). The EORTC-QLQ-C30 was translated into several languages and has been used in numerous studies. Negative impact of treatment on health-related quality of life is influenced by physical, somatic, emotional, psychological, financial, and social dimensions. Other studies reported that health-related quality of life of cancer patients deteriorates with anxiety and depression. Also, it has been shown that the severity level of depression increases with cancer symptoms.

While Concurrent Chemoradiation Treatment (CCRT) is available and administered to cervical cancer patients in Morocco, who are mainly diagnosed at advanced disease stages, no studies have evaluated the post-treatment health-related quality of life of women with cervical cancer. Therefore, the current study aimed to evaluate both anxiety/depression disorders and the EORTC QLQ-C30 dimensions during the post-treatment period of cervical cancer patients in Morocco, and to examines the relationships between the EORTC QLQ-C30 subscales and the HADS-anxiety and depression scale.

2. Materials and methods

2.1. Study design

We conducted a cross-sectional study to evaluate the health-related quality of life by measuring simultaneously the QLQ-C30 dimensions and anxiety/depression of cervical cancer patients treated by CCRT. Patients were recruited from the Mohammed VI Center for Cancer Treatment, University Hospital Center Ibn Rochd, Casablanca, Morocco, during the period of September 2020 to March 2021. This oncology center receives patients with all stages of cervical cancer from both urban and rural areas of the Casablanca-Settat region, the country’s economic capital. During the six-month study period, the center received 114 women for cervical cancer treatment with CCRT. Among them, 103 (90%) agreed and consented to participate in our study.

2.2. Ethics approval of research

This study was conducted according to the Helsinki Declaration of ethics. The participants completed the questionnaire anonymously and the data were coded. A consent letter for participation and publication was presented to the respondents. Solely participants giving their consent were included in the study. Also, participants were informed that they will receive results of this study once they are published. This study was approved by the ethics committee of Hassan First University. The confidentiality of personal and clinical data was guaranteed and all analysis were processed anonymously.

2.3. Study size

Using the cross-sectional sample size calculation formula, the number of women participating to the study was estimated as:

\[ n = \frac{N\alpha^2p(1-p)}{(\alpha^2 + Z^2p(1-p))} \]

Where, \( N = 2165 \) is the number of new cases of cervical cancer in Morocco in 2020; \( p = 7.2\% \) is the percentage of cervical cancer from all types of women cancers in Morocco. Considering a margin error of 5% and a confidence level of 95%, the minimum number of participants to be included in this study was \( n = 98 \). Expecting a 20% non-response rate, the total sample size was \( n = 118 \) women.

2.4. Participants

The inclusion criteria of the patients in the study were: (i) Women over the age of 18, (ii) confirmed diagnosis of cervical cancer, and (iii) no history of concurrent or past cancers. Patients were identified during routine treatment. Of the 103 patients recruited in the study, 42 (40.78%) completed the questionnaire in writing while 61 (59.22%) completed the questionnaire verbally through two trained interviewers. The response rate for participation in the study was 90.35% (103/114). The reasons for refusal for the 11 patients were mainly feeling tired or pain. Participants answered the questionnaire after finishing treatment.

2.5. Measurement

The questionnaire comprised the following sections: (i) socio-demographic characteristics (age, place of residence, educational status, marital status, professional category, socio-economic level, and parity), (ii) clinical characteristics (age of first sexual intercourse, age of first pregnancy, contraceptive methods, history of gynecological infections, age of menopause, comorbidity, and cancer stage), (iii) the Moroccan Quality of Life Questionnaire-Core 30 (QLQ-C30) questionnaire version, and (iv) Hospital Anxiety and Depression Scale (HADS) instrument. The average time required by each participant to complete the questionnaire was approximately 20 min.

2.5.1. EORTC QLQ-C30

The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30) represents a specific cancer questionnaire, and comprises thirty items including (i) five functional scales: the physical function (items 1 to 5), role function (items 6 and 7), social function (items 26 and 27), cognitive function (items 20 and 25) and emotional function (items 21 to 24), (ii) nine symptom scales: fatigue (items 10, 12 and 18), nausea (items 14 and 15), pain (items 9 and 19), dyspnea (item 8), insomnia (item 11), appetite loss (item 13), diarrhea (item 17), constipation (item 16) and financial difficulties (item 28), and (iii) one dimension (item 29 and 30) to assess the global health status. For each functional and symptomatic item, there are four types of response: (not at all, a little, quite a bit, and very much), while for the items of global health status there are seven points of response ranging from 1 (very bad) to 7 (excellent). The scores of the EORTC QLQ-C30 dimensions ranged from 0 to 100. High scores for global health status and functioning dimensions correspond to high health-related quality of life, whereas high scores for symptom dimensions correspond to low health-related quality of life.

2.5.2. Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale (HADS), developed by Zidmon and Snith, translated and validated in Arabic, comprises two sub-scales: the first assessing general anxiety level (7 items) and the second evaluating the depression level (7 items). For each item, the response was scored from 0 to 3. The total points of each subscale were 21. For each subscale (anxiety/depression), the scores in the ranges 0–7, 8–10, and 11–21 showed absence, mild, and severe anxiety/depression, respectively. The Cronbach’s alpha for the HADS Instrument used in this study was 0.97 which exhibiting a very good validity.

2.6. Statistical analysis

Categorical variables were reported as number and percentage while continuous variables were presented by means and standard deviation. The statistic inference was carried out using the ANOVA and Student
tests for multiple and two sample comparisons, respectively. The p-values were corrected by the Bonnerfoni-Holm test. Correlation between the EORTC QLQ-C30 quality of life subscales, HADS-Anxiety and HADS-Depression scale were assessed using Spearman’s correlation coefficient. The multiple linear regression was carried out to identify the predictors of anxiety disorders. All statistical analysis was performed at a significance level α = 0.05 using the R software (R version 4.0.3).

3. Results

3.1. Demographic and clinical characteristics

A total of 103 patients who received a CCRT treatment for cervical cancer were included in this study. Regarding the demographic characteristics (Table 1), 50.5% were under 50 years old, 61.2% were married while 8.7% were singles. Most of the participants (97.1%) were housewives and 65% of patients were urban residents. Concerning the education levels, 59.2% of women had never gone to school. About three-quarters of the patients had average and high socio-economic levels (77.7%). Forty-nine patients had more than four children (52.1%).

Clinical characteristics analysis (Table 1) showed that the majority of women had their first sexual intercourse after the age of 16 years (67%), their first pregnancy after the age of eighteen (69.1%), and their menopause after the age of 45 years (76.5%). The hormonal contraceptive method was the most used for the vast majority of by the patients (79.8%). Among the surveyed patients, 68.9% had no comorbidities and 65% had no gynecological infections. The majority of patients (90.3%) had been diagnosed with cervical cancer five years before the start of the study. The FIGO stage III (48.6%) was the most frequent in the study patients followed by stage II (32%). Among the 103 patients, there were only 10 who lived more than 5 years with their cervical cancer and were in stage III.

3.2. Assessment of health-related quality of life, anxiety and depression

The EORTC QLQ-C30 scores for the 103 cervical cancer patients enrolled in this study were summarized in Table 2. The mean general health status score was 63.92 ± 13.63. Among the five functioning scales, emotional functioning (51.78 ± 32.98), physical functioning (54.17 ± 28.78), and role functioning (58.74 ± 31.21) were the worst. Social functioning (93.53 ± 20.90) and cognitive functioning (82.52 ± 18.43) reached the highest scores. Among the nine symptom scales (Table 2), appetite loss had the highest score (58.90 ± 31.38) indicating that was the most affected by cervical cancer. Women in this study had low symptoms for constipation, dyspnea, and diarrhea (symptomatic scores ranged from 21.36 to 29.77). Moderate scores were observed in financial difficulties, nausea/vomiting, insomnia, fatigue, and pain (symptomatic scores from 38.83 to 46.28). By adjusting on the time since cancer diagnosis (<5 vs >5 years), results of the Student test revealed no difference between the two groups of women regarding all the EORTC QLQ-C30 dimensions (Table 2). Concerning the FIGO stage, women in stage II of cervical cancer had a poor health-related quality of life (low scores in the functional scales and high scores in the symptom scales) compared to those in stages III and IV. Diarrhea was the most affected symptom (37.37; p-value = 0.027).

The assessment of anxiety and depression using the HADS scale showed that the majority of the patients had mild and severe anxiety (30.1% and 54.4%, respectively); and mild and severe depression (35.9% and 51.5%, respectively).

3.3. Correlations between EORTC QLQ-C30 quality of life subscales and HADS-anxiety and depression scale

Spearman’s correlation coefficient was used to investigate the correlation between the EORTC QLQ-C30 quality of life subscales and HADS-Anxiety and Depression scale (Table 3). The HADS-Anxiety was negatively correlated with overall quality of life (r = −0.360, p < 0.001), physical functioning (r = −0.366, p < 0.001), role functioning (r = −0.319, p < 0.001), emotional functioning (r = −0.431, p < 0.001), and cognitive functioning (r = −0.385, p < 0.001). Also, anxiety was positively correlated with fatigue (r = 0.457, p < 0.001), pain (r = 0.215, p < 0.05), insomnia (r = 0.361, p < 0.001), and constipation (r = 0.197, p < 0.05). However, except for diarrhea (r = 0.231, p < 0.05), there was no significant correlation between HADS-Depression and all EORTC QLQ-C30 functional scales and symptoms. In addition, anxiety was positively associated to depression (r = 0.396, p < 0.001).

3.4. Predictive factors of anxiety disorders

Table 4 displays multiple linear regression model. The main predictors of anxiety in women with cervical cancer according to
multivariate analysis were: emotional functioning, fatigue and insomnia. Lower emotional functioning and greater fatigue and insomnia contributed significantly to higher anxiety.

4. **Discussion**

This cross-sectional study (i) evaluates both psychosocial distress and health related quality of life during the post-treatment period of cervical cancer patients in Morocco, (ii) examines the relationships between the EORTC QLQ-C30 quality of life subscales and the HADS-anxiety and depression scale and (iii) determines predictive factors of anxiety disorders in these patients.

The key findings of this study were that patients with cervical cancer in Morocco suffer post-treatment psychological disturbances and decreased health-related quality of life. The most diminished functional dimension was “emotional function” followed by “physical function” and “role function”, confirming similar findings from previous studies. In addition, we found that “social functioning” was the least affected by cervical cancer, which was also reported by Khalil et al. This result could be explained by the better support provided to the patients by their families throughout the illness. However, Park et al. showed that cervical cancer had a significant impact on the social functioning, due to cultural and spiritual disparities between countries. The evaluation of symptomatic dimensions revealed that “appetite loss”, “pain”, “fatigue” and “nausea/vomiting” were the most affected by cervical cancer, while “constipation” and “dyspnea” dimensions were the least affected in patients, which is in adequacy with literature findings.

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functioning and cognitive functioning; and a higher score of fatigue, pain, insomnia and constipation. A correlation between anxiety and cancers in previous studies.

Papadopoulos and colleagues indicated that anxious patients with lung cancer showed that patients with lung cancer had 2-3 times higher rates of insomnia related to a higher level of anxiety. A correlation between anxiety and physical function observed among participants in our study was also reported among patients with gastrointestinal cancer where the loss of muscle function was correlated to a higher level of anxiety. A Tunisian study showing a strong association between pain and anxiety disorders in Colon cancer patients. This result is consistent with our study showing a positive correlation between anxiety score and symptoms of pain. However, this association was not confirmed after adjustment in a multivariable linear regression model. This study had a few strengths. First, this study is the first to examine the relationships between the EORTC QLQ-C30 scales, anxiety and depression in a population of Moroccan patients with cervical cancer. Second the study used an internationally validated and reliable health-related quality of life questionnaire. Third, the high response rate of patients and the focus on the second most common cancer in Morocco is another strength. Finally, the large university cancer center representing the main cancer treatment facility in Casablanca-Settat region provided a unique opportunity for access to a large number of patients in post-treatment. It is important to recognize two limitations of the study: (i) The difficulty of having a control group. For example, if healthy women are considered as controls, the comparison would not be informative since healthy are not treated. Women with breast cancer undergoing CCRT can be chosen as controls, but in this case, the study would become a comparative study between the two cancers. (ii) We could not evaluate the health-related quality of life at different times points of measurement in the post-treatment. This could have provided additional information on the evolution of health-related quality of life of women with cervical cancer as a function of time after CCRT.

5. Clinical implications

Decision-makers in Morocco should prioritize the development and implementation of patients reported outcomes measurement in order to enhance the patient care and health related quality of life. This study suggests that future efforts should address policies that can help institute psychological support clinics in cancer centers in Morocco. Also, assessment of health-related quality of life, early screening of anxiety/depression, and management of treatment complications should be included in a standard procedure during cancer treatment for cancer patients that will help them to detect early psychological disturbances and treatment complications and help them to improve their impaired health-related quality of life. Finally, it is interesting to implement the health-related quality of life concept as a health promotion program to monitor the health-related quality of life of cervical cancer patient.

6. Conclusion

This study showed that the health-related quality of life and the psychological status of cervical cancer patients in Morocco were negatively affected. Emotional functioning, fatigue and insomnia were the main predictors of anxiety disorders in women with cervical cancer. Lower emotional functioning and greater fatigue and insomnia contributed significantly to the higher anxiety level. According to our findings, health-related quality of life must be improved; hence the need for psychological management and a structured psychoeducational program at the hospital level to address the health-related quality of life domains impacted negatively by cervical cancer. It appears to note that the assessment of the health-related quality of life oncology will help highlight the benefits of improved care to patient’s well-being.

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Ethical approval of studies and informed consent

This study was conducted according to the Helsinki’s Declaration of ethics. The participants completed the questionnaire anonymously and the data were coded. A consent letter for participation and publication results was presented to the respondents. Solely participants giving their consent were included in the study. Also, participants were informed that they will receive results of this study once they are published. This study was approved by the ethics committee of Hassan First University. The confidentiality of personal and clinical data was guaranteed and all analysis were processed anonymously.

Declaration of competing interest

None.

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