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Original Article

Relationships Between Chronic Fatigue Syndrome, Experiential Avoidance, and Health-Related Quality of Life in Cervical Cancer Cases Mediated by Depression

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Abstract

Background: The diagnosis of cervical cancer significantly affects the health-related quality of life (HRQOL) of women. This study aimed to investigate the relationships between chronic fatigue syndrome (CFS) and experiential avoidance (EA) with HRQOL, mediated by depression in women with cervical cancer.
Methods: This descriptive-correlational study selected 261 cervical cancer cases in Mashhad, Iran in 2021, using purposive sampling from October 10, 2021 to December 24, 2021. The research tools include the SF-36 Questionnaire, the Chalder Fatigue Scale, the Brief Experiential Avoidance Questionnaire, and Beck Depression Inventory. Data analysis was done using Pearson correlation coefficient and structural equation modeling in SPSS version 27 and AMOS version 24.
Results: The results indicated that all direct paths, with the exception of CFS, significantly correlated with HRQOL ($P<0.001$). Depression mediated the significant indirect paths of CFS to HRQOL and the significant relationship between EA and HRQOL ($P<0.001$).
Conclusions: The findings of this study revealed that CFS and EA were negatively related to HRQOL in women with cervical cancer. Moreover, depression mediated the relationship of CFS and EA with HRQOL.

Keywords: Cervical cancer, Quality of life, Chronic fatigue syndrome, Depression, Women

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1. Introduction

Despite recent breakthroughs in medical science, cancer remains a crucial disease of the century (1, 2). Furthermore, invasive cervical cancer is the second leading cause of women's death worldwide (3). Caused by abnormal cell growth, cervical cancer cells can spread to or attack other parts of the body. Although there are usually no symptoms in the beginning, the following symptoms include dyspareunia, vaginal bleeding, and pelvic pain (4). Hormonal imbalance is a crucial factor that increases the risk of cervical cancer. In particular, high levels of the estrogen hormone further increase the risk of cervical cancer. The factors that cause estrogen imbalance in the body are obesity, diabetes, and hormone replacement therapy (5, 6).

The diagnosis of cervical cancer in women disrupts the health-related quality of life (HRQOL), which can predict the severity and impacts of diseases, injuries, and disabilities and measure mental health in societies (7, 8). According to the World Health Organization, a person's quality of life is his/her perception of his/her place in life, the cultural context, and the value system, which is related to his/her goals, aspirations, criteria, and priorities (9, 10). Studies showed that indicators of HRQOL include health, capability, happiness, maintenance of sensitive functions, and being pain-free (11-13).

There are various factors of HLQOL in cervical cancer cases such as chronic fatigue syndrome (CFS). Higher stress in patients produces symptoms of CFS. The literature suggested that many cancer patients exhibit fatigue, which is typically described as weakness or exhaustion (14). In fact, the absence of mental or physical activities can intensify CFS as a medical condition (15). CFS differs from other chronic and common types of fatigue such as fatigue caused by anemia, vitamin D deficiency, and depression mainly by the intensification of symptoms after physical or mental activity (16). It affects the entire body and severely hinders a

person's physical and mental activities (17). Several studies reported the relationships between fatigue and sleep quality, quality of health life, depression, and HRQOL (18-20).

Experiential avoidance (EA) is among the psychological structures affecting the severity of cervical cancer in stressful conditions (21). EA includes various mental strategies that people employ to change their thoughts during social communication (22). According to Nilsson (23), people make assumptions about themselves and their environments while dealing with a social situation. These hypotheses are perfectionistic and biased criteria for social performance that can produce physical and psychological symptoms (24). Several studies analyzed the relationship between EA, quality of life, and self-compassion (25, 26).

In addition to their direct correlations with HRQOL, CFS and EA can indirectly affect the HRQOL of women with cervical cancer due to depression. Depression is a common mental disorder that represents the natural human response to environmental pressures. The affected person exhibits different symptoms such as low mood with lower energy and interest, guilt, difficulties with concentration, anorexia, and suicidal thoughts (27). Clinically depressed cases may experience symptoms such as change in appetite, insomnia or oversleeping, lower energy and fatigue, loss of interest and pleasure in past recreational activities, sense of inadequacy, self-blame or guilt, and compromised reflection or concentration (28). There is also a strong correlation between depression and suicide (29). Several studies reported the relationships of anthropometric indicators and quality of life with depression (30, 31).

The diagnosis of cervical cancer brings much psychological, physical, domestic, social, and economic trauma and could severely reduce the affected person's personal-social interactions. A proper understanding of the psycho-social factors underlying decision-making and behavior (HRQOL) will be helpful in designing special solutions to this crisis. This research aimed to investigate the relationships between CFS and EA with HRQOL through the mediating role of depression in patients with cervical cancer, according to the materials mentioned.

2. Methods

2.1. Design and Participants

This descriptive-correlational study utilized structural equation modeling (SEM). The study population consisted of all women diagnosed with cervical cancer in Mashhad, Iran in 2021. From October 10, 2021 to December 24, 2021, a purposive sampling method was used to select 261 women with cervical cancer who met the inclusion criteria. The sample size was determined based on the number of research variables (32), with a total of 18 observed variables (18×10+50=230). In anticipation of participant dropouts, 270 questionnaires were distributed among women with cervical cancer. Finally, after removing participants who did not complete the questionnaires correctly, data from 261 individuals were considered for analysis. Inclusion criteria included cervical cancer patients who had filled and signed the written consent form, were between 20 and 50 years old, had at least a high school diploma, were not receiving psychological treatment concurrent to the study, and at least three months had passed since their cancer diagnosis. Exclusion criteria included failure to answer all questions and unwillingness to continue collaborating in the research.

2.2. Instruments

The Chalder Fatigue Scale was utilized to measure the physical and mental symptoms of fatigue, which are considered as the indicators of Chronic Fatigue Syndrome (CFS). It comprises 14 items and 4 components, namely cognitive problems, drowsiness, endurance and strength, and lack of motivation and interest. The items are scored on a four-point Likert scale (ranging from 0: none to 3: high (33). The fatigue scale's score ranges from 0 to 42, with a higher score indicating more fatigue. The Content Validity Index (CVI=0.90) and Content Validity Ratio (CVR= 0.88) confirmed the Chalder fatigue scale's content validity (34). Daneshmandi and colleagues (34) reported an alpha Cronbach coefficient of 0.85 for the questionnaire. In our research, the Cronbach's alpha of this scale was 0.87.

SF-36 Questionnaire (SF-36): The SF-36 consists of 36 questions and 8 components (i.e., physical function, functional constraints due to physical and emotional health problems, energy

and vitality, emotional health, social performance, pain, and general health). It has a minimum score of 0 and a maximum score of 100, divided into four levels including very poor quality of life for scores below 45, poor quality of life for scores within 45–60, good quality of life for scores within 60–75, and optimal quality of life for scores above 75 (35). The questionnaire's content validity (CVI= 0.95, CVR= 0.89) was determined according to Brazier and colleagues (36), and the total test reliability was 0.85. The Cronbach's alpha of this questionnaire was 0.82 in our study.

The Brief Experiential Avoidance Questionnaire (BEAQ): Gámez and colleagues (37) developed the 15-item Experiential Avoidance Questionnaire to measure EA from different aspects, i.e., thought withdrawal, thought substitution, distraction, situational avoidance, and conversion of perception into thought. The items are scored on a 6-point Likert scale from completely disagree to completely agree (1 to 6), with total scores ranging from 15–90 and a higher score indicating high EA. Moradi and colleagues (38) reported a Cronbach's alpha coefficient of 0.84 for the BEAQ. The Cronbach's alpha of the BEAQ was 0.79 in our research. The CVI and CVR were also calculated, and the results for each were 0.89 and 0.87, respectively.

Beck Depression Inventory: Beck and co-workers (39) developed the Depression Inventory to measure depression. It includes 21 four-option items that participants select to show the severity of their depression symptoms. Each item is scored within the 0–3 range, with total scores ranging from 0–63. A higher score in this questionnaire indicates more depression in a person. Farzadkia and colleagues (40) reported a Cronbach's alpha coefficient of 0.87 for the Beck Depression Inventory. The content validity of the Beck Depression Inventory was confirmed with CVI=0.91 and CVR=0.88. The Cronbach's alpha of the questionnaire was 0.85 in our study.

2.3. Procedure

After obtaining the necessary permits to conduct the research and receiving ethics approval from the university's ethics committee with the code: IR.IAU.AHVAZ.REC.1401.033, women with cervical cancer were identified by referring to the medical centers of Mashhad, Iran. In the next step, by contacting the women with cervical cancer, they were given explanations about the research implementation procedure. Women who met the criteria to enter the research were selected, and the research questionnaires were provided to them. Finally, by collecting the questionnaires, those that were correctly completed were analyzed.

2.4. Statistical Analyses

In addition to descriptive statistics (i.e., mean and standard deviation), the Pearson correlation coefficient and structural equations modeling were used for data analysis in SPSS version 27 and AMOS version 24.

3. Results

The mean and standard deviation of the age of participants were 33.75±7.06. In terms of education, 40.53% of participants had high school diplomas, whereas 59.47% of them were university graduates. Table 1 presents the mean, standard deviation, and Pearson correlation coefficient of all variables. Figure 1 demonstrates the preliminary proposed model for explaining HRQOL based on CFS, EA, and depression.

As the root mean square error of approximation (RMSEA=0.324) indicated that the preliminary model required modification, it was found that the preliminary model was saturated for having drawn all possible paths, and therefore, it could not calculate Chi-square and other indicators. The removal of one path (CFS to HRQOL) de-saturated the model, allowing the software to measure the Chi-square ($\chi 2$). Figure 2 depicts the final model. In

Table 1: Mean, standard deviation (SD), and Pearson correlation coefficients of the research variables

Variables	Mean	SD	1	2	3	4
1- Health-related quality of life	35.44	7.13	1			
2- Chronic fatigue syndrome	25.03	6.09	-0.27**	1		
3- Experiential avoidance	80.84	10.49	-0.31**	0.32**	1	
4- Depression	30.23	10.31	-0.43**	0.41**	0.34**	1

**P<0.01

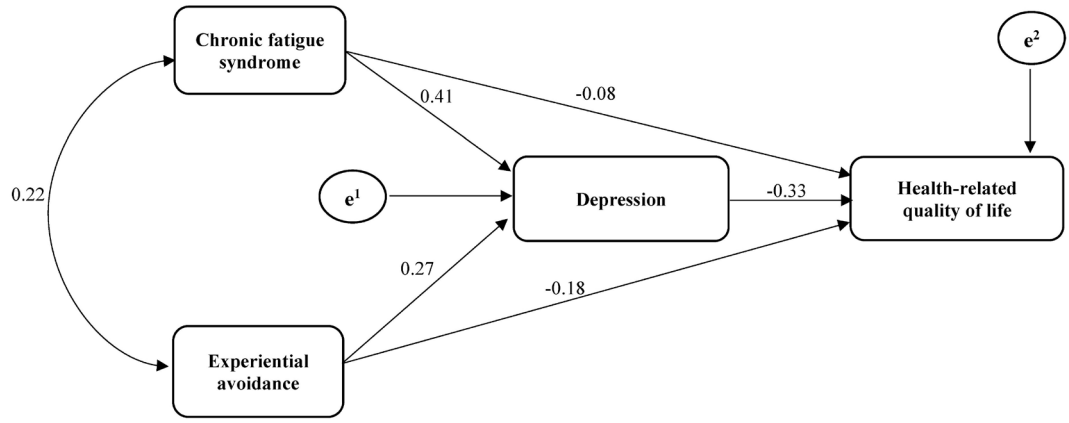

Figure 1: The figure shows the initial model of the research.

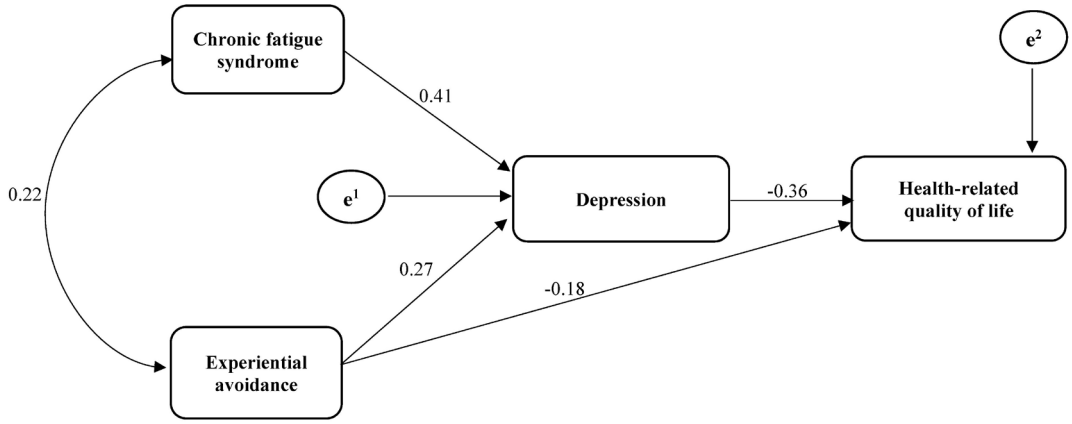

Figure 2: The figure shows the final modified model of the research.

Table 2: Initial and final models fit indicators

Fit indicators	χ^2	df	(χ^2/df)	IFI	RFI	TLI	CFI	NFI	RMSEA
Initial model	-	-	-	-	0.86	-	0.89	-	0.324
Final modified model	1.48	1	1.48	0.99	0.94	0.98	0.99	0.99	0.043

IFI: Incremental Fit Index; RFI: Relative Fit Index; TLI: Tucker Lewis Index; CFI: Comparative Fit Index; NFI: Normed Fit Index; RMSEA: Root Mean Square Error of Approximation

Table 3: Direct relationships between variables in the final modified model

Path	Path type	β	P
Chronic fatigue syndrome → Health-related quality of life	Direct	-0.08	0.222
Chronic fatigue syndrome → Depression	Direct	0.41	0.001
Experiential avoidance → Health-related quality of life	Direct	-0.18	0.002
Experiential avoidance → Depression	Direct	0.27	0.001
Depression → Health-related quality of life	Direct	-0.36	0.001

the final model, the root mean square index of the approximation error (RMSEA=0.043) suggested that the model had a good fit (Table 2).

Table 3 reports the estimated path coefficients for the examination of direct paths. There was a direct and significant relationship between CFS and depression (β=0.41, P<0.001) in patients with cervical cancer. There was a direct relationship between EA and depression (β=0.27, P<0.001). There was a negative relationship between EA (β=-0.18, P=0.002) and depression (β=-0.36, P<0.001) with HRQOL in patients with cervical cancer. There was no significant relationship between CFS and HRQOL in the patients.

Table 4 indicates the significance of the indirect path of CFS to HRQOL mediated by depression

Table 4: Indirect relationships between variables in the final modified model

Path	β	P
Chronic fatigue syndrome → Health-related quality of life (mediated by depression)	-0.175	0.010
Experiential avoidance → Health-related quality of life (mediated by depression)	-0.067	0.010

(β=-0.175, P=0.010) and the significance of the indirect path of EA to CFS mediated by depression (β=-0.067, P=0.010).

4. Discussion

This study was conducted to investigate the mediating role of depression in the relationships between CFS and EA with HRQOL in patients with cervical cancer. The results showed that all direct paths, except CFS, had a significant correlation with HRQOL. Indirect paths also had a significant correlation with HRQOL through depression. The first finding indicated the lack of a significant correlation between CFS and HRQOL. This finding does not match the results of previous studies (18, 19), which found a significant correlation between CFS and HRQOL in correlation coefficient and regression tests. However, this study tested the hypotheses using structural equation modeling. In this study, the correlation between CFS and HRQOL in the Pearson test was significant at first. Nevertheless, the model explained the entire share and effect of CFS on HRQOL through the mediating variable or the indirect path. In other words, CFS had an indirect relationship with HRQOL. In general, patients with higher CFS will be less stable against the problems associated with the disease, psychological stress, natural threats and disasters, and mental illnesses, degrading their HRQOL (15).

Another finding was the significant correlation between EA and HRQOL. This finding is in accordance with the research results of previous studies (25, 26). EA is associated with the incidence of mental and physical health disorders. Previous studies indicated that EA results in the use of negative strategies such as denial, behavioral dissociation, blame, and self-destruction (26). Cervical cancer patients experience many negative emotions such as embarrassment and depression, and avoidance strategies for coping with these emotions can intensify their long-term distress and degrade their physical and psychological quality of life (25). In other words, EA is a person's reluctance to be involved in unwanted internal experiences, and it is assumed to have outcomes and intensify long-term distress. At the same time, lower EA promotes the HRQOL of patients.

The results indicated a direct negative correlation between depression and HRQOL of cervical cancer patients and expected improvement in HRQOL by reducing depression in women with cervical cancer. This finding can be explained by the notion that depression affects thoughts, feelings, energy, concentration, sleep, and even sexual interests (18). Depressive situations include failure in education or work, loss of loved ones, or the knowledge that the disease is weakening the person (40). In addition to affecting the body and reducing physical strength, the disease also renders a patient mentally and socially vulnerable (41). In other words, it reduces the patient's HRQOL. These changes cause depression.

According to the results, depression mediated the relationship between CFS and EA with HRQOL. In the direct path, there were no significant correlations between CFS and HRQOL. In the indirect path, CFS and HRQOL were correlated only when CFS in cervical cancer patients was associated with higher depression, thereby reducing their HRQOL. At the same time, the results indicated a significant correlation between EA and HRQOL. EA in women with cervical cancer is also associated with higher depression, which reduces HRQOL (7). Moreover, the disease plays a significant role in reducing HRQOL and increasing EA and depression in chronic diseases. In addition to EA, depression, and CFS, chronic diseases expose patients to other mood disorders, the severity of which depends on the severity of the disease (41).

4.1. Limitations

This study is limited by the use of a self-report instrument, which may have affected the accuracy of reports due to the social desirability bias of participants. Among the other limitations of this research, it can be pointed out that the economic level variable of the family of cervical

cancer patients was not included in the modeling. The design of the present study was a descriptive correlation that does not prove causation. Moreover, the results should be generalized to other patients and cities with caution due to the limited statistical population of cervical cancer patients in Mashhad, Iran. To resolve this problem, similar research can be conducted in other cities to analyze patients with chronic diseases and then compare the results.

5. Conclusions

The proposed research had a good fit and proved efficient in identifying the HLQOL factors of cervical cancer patients. Hence, the conceptual model can be considered a novel scientific achievement that improves the HRQOL of patients. Therapists are recommended to promote HRQOL with new treatments to improve EA and depression in patients with chronic diseases.

Ethical Approval

The ethical approval was obtained from Islamic Azad University-Ahvaz Branch with the code of IR.IAU.AHVAZ.REC.1401.033. Also, written informed consent was obtained from the participants.

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Conflict of Interests: None declared.

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