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Quality of Life and Sexual Activity among a Group of Iranian Cervical Cancer Patients Undergoing Surgery or Radiotherapy

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Abstract

Background: This is a case-control study aimed at investigating the predictors of sexual function, depression levels, and quality of life in cervical cancer patients.

Methods: The study enrolled women aged 18 years and older who were at least six months post cervical cancer diagnosis and treatment in a single institution and underwent surgery or radiotherapy. The control group was selected from women referred for routine gynecologic screening. The study excluded women who had a history of sexual trauma and mental disorders, any general health problems, and therapy potentially affecting sexual life, such as hormonal therapies other than contraception. Demographic and clinical data of all participants were gathered, and all participants were asked to respond to two questionnaires: the Female Sexual Function Index (FSFI) and the Medical Outcomes Study 12-item Short Form health survey (SF-12) in a face-to-face interview. The study analyzed the data using descriptive statistics and comparison of demographics, clinical data, tumor and surgical characteristics. Linear regression tests were used to predict numerical outcomes, and a p-value <0.05 was considered statistically significant.

Results: The study concluded that there were no baseline characteristics identified to have statistically significant differences among study groups, and all three groups had similar distributions of socioeconomic and demographic variables.

Conclusion: This study showed that cervical cancer and route of treatment may affect the patients' quality of life and sexual health. Health care systems and health care providers may screen these patients and take early actions to prevent more morbidities.

Keywords: Cervical cancer, Lifestyle, Radiotherapy, Sexual activity, Surgery

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Introduction

Cervical cancer is the third most common cause of cancer deaths and the second most common cancer in women worldwide (1). Once the patient is diagnosed with cervical cancer, immediate treatment is warranted depending on the patient's age, health status, and degree of metastasis, stage of disease, and tumor size. Treatment options include surgery, radiotherapy, and chemotherapy. Recent studies of cervical cancer survivors documented significant healthcare-related quality of life concerns associated with the disease and adverse treatment effects (2-4). Sexual function is an important aspect of quality of life. Patients diagnosed with gynecologic cancer have negative perceptions of their sexual function; their issues must be addressed through a multi-layered structure of biological, sociological, and psychological care (5). When treating women with gynecologic cancer, healthcare professionals must consider potential psychological, social, and sexual issues. Thereby, the goal of this study was to investigate the predictors of sexual function, depression levels, and quality of life in cervical cancer patients.

Materials and Methods

The current case-control study included women aged 18 years old and more; who were at least 6 months post cervical cancer diagnosis and treatment in a single institution and underwent surgery or radiotherapy. The control group was selected from women referred for routine gynecologic screening. The study was approved by the institutional medical ethics committee. All the individuals gave their informed consent within a written contract prior to their inclusion in the study. All the participants have been thoroughly informed about the study's confidentiality. The study only included heterosexual women who had a current sexual partner. The history of sexual trauma and mental disorders, any general health problems, and therapy potentially affecting sexual life, such as hormonal therapies other than contraception, were all exclusion criteria (6).

Demographic and clinical data of all the participants were gathered. All participants were asked to respond to two questionnaires: SF-12 and FSFI in a face-to-face interview.

The Female Sexual Function Index (FSFI)

questionnaire consists of 19 self-reported questions in 6 domains on sexual activity within the 4 weeks prior to the examination: questions number 1–2 (sexual desire), questions number 3–6 (sexual arousal, questions number 7–10 (lubrication), questions number 11–13 (orgasm), questions number 14–16 (satisfaction) and questions number 17–19 (pain). Points are assigned for each answer (1–5 for questions 1–2 and 0–5 for questions 3–19), the sum of the scores of each domain is multiplied by the domain factor. Domain factor is representative of domain importance in the final score. The six domain scores are added up, and the total score is calculated which varies from 2.0 to 36.0 points. The greater points are representative of better results. The English version of this survey was translated into Persian by two native Persian speakers and backward translated into English by two English native speakers, and finally, a panel of experts confirmed the final Persian version of the survey (7,8). The medical outcomes study 12-item Short Form health survey (SF-12) is a health-related quality-of-life questionnaire consisting of 12 questions that measure eight health domains to assess physical and mental health, namely the Physical Component Summary (PCS) and the Mental Component Summary (MCS). We used the validated Persian form of this questionnaire (9,10).

Statistical analysis

Descriptive statistics and comparison of demographics, clinical data, tumor and surgical characteristics were calculated and depicted in tables 1 and 2 as number (% percent). Comparison of all these categorical variables among study groups (Tables 1 and 2) is performed using chi-square and fisher's exact test. All numerical scores of the study groups are shown as mean±SD and for comparison, we utilized Analysis of Variance (ANOVA) test. Linear regression tests were used to predict numerical outcomes. p-value <0.05 was considered as statistically significant. Statistical analysis was performed using SPSS 22(IBM corp., Armonk, New York, USA).

Results

A total of 70 patients including 35 radiotherapy cases and 35 surgery cases were enrolled in the study. Type of treatment of each patient was chosen according

Table 1. Demographics and clinical data

Variable		p-value	All patients	Groups		
				Surgery	Radiotherapy	Control
Age	21-30	0.730	9 (8.2%)	1 (2.9%)	2 (5.7%)	6 (15.0%)
	31-40		17 (15.5%)	7 (20.0%)	6 (17.1%)	4 (10.0%)
	41-50		32 (29.1%)	12 (34.3%)	10 (28.6%)	10 (25.0%)
	51-60		26 (23.6%)	6 (17.1%)	9 (25.7%)	11 (27.5%)
	61-70		19 (17.3%)	7 (20.0%)	6 (17.1%)	6 (15.0%)
	71-80		7 (6.4%)	2 (5.7%)	2 (5.7%)	3 (7.5%)
Marital status	Not married	0.652	31 (28.2%)	8 (22.9%)	10 (28.6%)	13 (32.5%)
	Married		79 (71.8%)	27 (77.1%)	25 (71.4%)	27 (67.5%)
Education level	Below high school	0.691	37 (33.6%)	13 (37.1%)	10 (28.6%)	14 (35.0%)
	High school degree		27 (24.5%)	8 (22.9%)	12 (34.3%)	7 (17.5%)
	Associate degree		23 (20.9%)23	8 (22.9%)	8 (22.9%)	7 (17.5%)
	Bachelor's degree		19 (17.3%)	4 (11.4%)	4 (11.4%)	10 (25.0%)
	Over bachelor's degree		4 (3.6%)	1 (2.9%)	1 (2.9%)	2 (5.0%)
Smoking	Yes	0.231	16 (14.5%)	8 (22.9%)	4 (11.4%)	4 (10.0%)
	No		94 (85.5%)	27 (77.1%)	31 (88.6%)	36 (90.0%)
History of hypertension	Yes	0.789	36 (32.7%)	14 (37.1%)	11 (31.4%)	12 (30.0%)
	No		74 (67.3%)	22 (62.9%)	24 (68.6%)	28 (70.0%)
History of depression	Yes	0.224	31 (28.2%)	7 (20.0%)	9 (25.7%)	15 (37.5%)
	No		79 (71.8%)	28 (80.0%)	26 (74.3%)	25 (62.5%)
History of diabetes	Yes	0.518	15 (13.6%)	3 (8.6%)	5 (14.3%)	7 (17.5%)
	No		95 (86.4%)	32 (91.4%)	30 (85.7%)	33 (82.5%)
History of asthma	Yes	0.841	4 (3.6%)	1 (2.9%)	1 (2.9%)	2 (5.0%)
	No		106 (96.4%)	34 (97.1%)	34 (97.1%)	38 (95.0%)

Table 2. Tumor and surgical characteristics

Time from diagnosis	p-value	All patients	Group	
	0.610		**Surgery**	**Radiotherapy**
<2 years		27 (38.6%)	13 (37.1%)	14 (40.0%)
2-6 years		32 (45.7%)	15 (42.9%)	17 (48.6%)
>6 years		11 (15.7%)	7 (20.0%)	4 (11.4%)
Stages of cancer at diagnosis				
1a		10 (14.3%)	8 (22.9%)	2 (5.7%)
1b		24 (24.3%)	16 (45.7%)	8 (22.9%)
2a		12 (17.1%)	7 (20.0%)	5 (14.3%)
2b	0.006	14 (20.0%)	3 (8.6%)	11 (31.4%)
3a		4 (5.7%)	0	4 (11.4%)
3b		5 (7.1%)	1 (2.9%)	4 (11.4%)
4 and above		1 (1.4%)	0	1 (2.9%)
Stages of cancer at diagnosis	0.006			
1a		10 (14.3%)	8 (22.9%)	2 (5.7%)
1b		24 (24.3%)	16 (45.7%)	8 (22.9%)
2a		12 (17.1%)	7 (20.0%)	5 (14.3%)
2b		14 (20.0%)	3 (8.6%)	11 (31.4%)
3a		4 (5.7%)	0	4 (11.4%)
3b		5 (7.1%)	1 (2.9%)	4 (11.4%)
4 and above		1(1.4%)	0	1 (2.9%)
Histology	0.294			
SCC		50 (71.4%)	23 (65.7%)	27 (77.1%)
Adenocarcinoma		20 (28.6%)	12 (34.3%)	8 (22.9%)
Adenosquamous		_	_	_
Ovaries condition	>0.001			
Intact		30 (42.9%)	10 (28.6%)	20 (57.1%)
RSO		3 (4.3%)	3 (8.6%)	_
LSO		3 (4.3%)	3 (8.6%)	_
BSO		18 (25.7%)	18 (51.4%)	_
Menopause		16 (22.9%)	1 (2.9%)	15 (42.9%)

to medical team decision completely independent of this study and after completion of their treatment, patients were enrolled in the study to complete the questionnaires. The control group was composed of 40 women who underwent routine screening tests in an outpatient gynecology clinic without specific complaints. The baseline patient demographic and clinical characteristics for each group are summarized in table 1. Overall, no baseline characteristics were identified to have statistically significant differences among study groups and all the 3 groups had similar distributions of socioeconomic and demographic variables (Table 1).

The majority of patients in either radiotherapy or surgery groups were 41 to 50 years old (28.6 and 34.3 %, respectively). A total of 22.9% of cases in the surgery group, 11.4% of cases in the radiotherapy group, and 10.0% of control cases had a history of smoking, but the difference among the groups was not statistically significant (p=0.231). A history of hypertension was reported in 30.0% of the cases in the control group, 31.4% in the radiotherapy group, and 37.1% in the surgery group, although the difference was not statistically significant (Table1). The total follow-up time of the patients in the surgery and radiotherapy group ranged between 6 months to 6 years. Table 2 shows the distribution of stages of cancer at diagnosis in radiotherapy and surgery groups. The most prevalent histologic report was squamous cell carcinoma in both groups followed by adenocarcinoma (Table 2). Table 2 also depicts the condition of ovaries in the surgery group and the menopause status in the radiotherapy group.

Scores for "whole SF-12", and "physical" and "mental" status separately indicated a statistically significant difference among groups. The mean of participants' reports on overall SF12 score in control, radiotherapy, and surgery groups was 32.73±7.55, 28±98.065, and 2.26±30.94, respectively which was significantly different. The patients in the surgery group reported having the lowest physical health (0.97±13.2) in comparison to the radiotherapy group (2.25±13.69) and control group (14.60±1.72). In terms of mental health scores, the surgery group (2.15±17.65) was reported to be mentally healthier than the radiotherapy group (14.37±4.46). Both mental and physical health score differences were statistically significant (Table 3).

As shown in table 4, the study observed the lowest overall sexual activity in the radiotherapy group followed by the surgery group and the control group. The differences were reported to be statistically significant (p<0.001).

Scores of the particular domains were reported to be different among study groups as follows:

Desire score was reported to be the lowest in the radiotherapy group followed by the control and surgery groups. The differences were not statistically significant.

Arousal score was reported to be the lowest in the radiotherapy group followed by the control and surgery groups. The differences were statistically significant.

Lubrication score was reported to be the lowest in the radiotherapy group followed by the surgery and control groups.

Orgasm score was reported to be the lowest in the radiotherapy group followed by the surgery and control groups.

Satisfaction score reported to be the lowest in the

Table 3. SF12 results

	p-value	Groups		
		Surgery SD±mean	Radiotherapy SD±mean	Control SD±mean
Overall quality of life	0.003	(35-24) 2.26±30.94	(39-16) 5.98±28.06	(43-20) 7.55±32.73
Physical health	**0.005**	(15-12) 0.97±13.29	(17-9) 2.25±13.69	(17-10) 1.72±14.60
Mental health	**0.002**	(22-11) 2.15±17.65	(24-6) 4.46±14.37	(26- 8) 6.18±18.13

Table 4. FSFI results

	p-value	Groups		
		Surgery SD±mean	Radiotherapy SD±mean	Control SD±mean
Sexual activity	>0.001	(32.20-2) 8.85±19.89	(22.50-2) 7.05±12.67	(34.40-2) 10.10±20.73
Desire	0.490	(6-1) 1.47±3.72	(6-1) 1.51±3.32	(6-1) 1.66±3.69
Arousal	0.082	(6-0) 1.78±3.16	(5-0) 1.82±2.30	(6-0) 1.93±3.14
Lubrication	>0.001	(5.40-0) 1.66±3.03	(4-0) 1.25±1.80	(6-0) 2.00±3.56
Orgasm	0.002	(5-0) 1.48±2.86	(4.40-0) 1.45±1.89	(6-0) 1.80±3.21
Satisfaction	>0.001	(4.80-0.8) 1.52±2.88	(3.60-0.8) 1.01±1.85	(6-0.8) 1.74±3.36
Pain	>0.001	(6-0) 1.86±4.22	(3.20-0) 1.10±1.48	(6-0) 1.91±3.77

radiotherapy group followed by the surgery and control groups.

Pain score was reported to be the lowest in the radiotherapy group followed by the control and surgery groups.

All differences except differences for the desire and arousal domains were statistically significant (Table 4).

In the linear regression, backward elimination regression and $p<0.25$ was used to determine the variables which best correlate with the quality of life and sexual activity. Table 5 shows the relationship between patient-reported hypertension and depression and quality of life. Our data showed that patients with a history of hypertension tend to have a lower quality-of-life score (β=-5.04, $p<0.001$). Additionally, a history of depression leads to lower quality of life scores (β=-2.94, p=0.013). The result of linear regression was assessed for the goodness of fit and demonstrated normality of residuals (p=0.059) and homogeneity of variance (p=0.600) and R Square was reported as 0.33, which showed the acceptability of the proposed regression model.

Table 6 shows predictors of sexual activity. In our proposed regression model, after backward

Table 5. SF12 score predictors

	p-value	β (95% CI)
History of hypertension	>0.001	-5.04 (2.83-7.25)
History of depression	0.013	-2.94 (1.08-5.27)

Table 6. FSFI score predictors

	p-value	β (95% CI)
Age	>0.001	-3.58 (2.40-4.75)
Marital status	0.012	3.58 (6.46-0.70)
Smoking	0.004	-5.26 (1.73-8.80)
Hypertension	0.034	-3.64 (1.83-6.98)

elimination, age, marital status, smoking, and history of hypertension showed a statistically significant correlation with sexual activity. With every 1-year increase in age, we expect a decrease by 3.58 in sexual activity score. In addition, for non-married

patients, patients with a history of smoking and history of hypertension the sexual activity scores are expected to decrease by 3.58, 5.26, 3.64, and 3.08, respectively.

The normality of residuals (p=0.057) and homogeneity of residuals variance (p=0.756) were assessed in the study population and the R square was reported as 0.56, which showed the acceptability of the proposed regression model.

Discussion

Cancer, according to the evidence, has a significant impact on a woman's sexuality, sexual functions, intimate relationships, and sense of self. Sexuality and intimacy issues have a significant impact on the quality of life of patients with gynecological cancers, particularly cervical cancer (11). This study provides the opportunity to investigate how cervical cancer treatment may affect women's sexual function and quality of life.

Scores of overall quality of life, physical and mental health, in 3 study groups are shown in table 3 and 4. This study revealed that according to SF-12 scores, all FSFI sub-domains and the total FSFI score almost all cervical cancer survivors had a lower sexual function and quality of life rather than the healthy control group, indicating that treatment may have a negative impact on these women's sexuality. The current study demonstrated that overall quality of life and mental and physical health were all better in the surgery group rather than the radiotherapy group.

Overall sexual function showed a statistically significant difference among 3 study groups. The radiotherapy group showed to have the lowest scores of overall sexual function, while the control group showed to have the highest score. This finding was similar to previously conducted studies (12,13).

In the study of Xiaotong Wu *et al*, chemotherapy and radiotherapy were common risk factors for sexual dysfunction, and radiotherapy exerted a stronger effect than chemotherapy (11).

In terms of sexual function subdomains, it is clear that scores of almost all domains were lower in the radiotherapy group compared to the surgery group. All the differences were reported to be statistically significant except sexual desire and arousal. It means that patients with cervical cancer who receive

radiotherapy will have a lower sexual function, sexual desire, arousal, lubrication, orgasm, and satisfaction, and may experience more pain during sexual intercourse than patients who receive surgery. In a two-year post-treatment study conducted by Jensen et al., it was discovered that 50% of cervical cancer survivors reported vaginal stenosis, 85% had low or no sexual interest, and 30% were dissatisfied with their sexual life (14). Radiotherapy can cause vaginal wall fibrosis/narrowing/adhesions, decreased elasticity, mucosal thinning, dryness, and even pelvic fibrosis, which provokes circulatory dysfunction, pain, and other symptoms (11). In our study, the patients who did not undergo radiotherapy were more likely to have a higher sexual function and quality of life scores. Thus, radiotherapy was an independent risk factor.

In this study, history of hypertension and depression were correlated with lower quality of life, but a history of diabetes and asthma, age, marital status, level of education, and smoking were not correlated with quality of life. Quality of life has been studied in different treatment options for cervical cancer and Michael Frumovitz *et al* in their study showed that postoperative quality of life is similar between the open versus minimally invasive radical hysterectomy groups (15). Jensen *et al* in their study identified both short- and long-term sequelae of radical hysterectomy. Within 6 months of treatment, women were at a high risk of dyspareunia, orgasmic difficulties, problems completing sexual intercourse, and overall sexual dissatisfaction (14).

Aside from our findings on differences within study groups, all cervical cancer patients regardless of the type of treatment had a total FSFI score lower than the cut-off value, indicating a risk of sexual dysfunction. As a result, there are compelling reasons to distribute the SF-12 and FSFI to all cervical cancer patients. This will allow for the screening of these patients for the quality of life and sexual disorders and taking appropriate actions by the health care providers.

Conclusion

This study showed that cervical cancer and route of treatment may affect the patients' quality of life and sexual health. Health care systems and health care

providers may screen these patients and take early actions to prevent more morbidities.

Limitations

The difficulty in recruiting cancer survivors is the main limitation of this study. This resulted primarily due to outdated medical records of our cervical cancer registry. This study included small sample size and more studies with larger sample size are warranted.

Conflict of Interest

Authors have no conflicts of interest.

Acknowledgements

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