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## **The difference of sexual function of cervical cancer survivor post radical hysterectomy with and without chemoradiotherapy according to FSFI scores**

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**Abstract**--This study was analytical observational with cross sectional design. From 2017 to 2021, 45 cervical cancer survivors who had radical hysterectomy were enrolled. The subjects were divided into four groups: radical hysterectomy only, hysterectomy combined chemotherapy, hysterectomy combined chemoradiotherapy, hysterectomy combined radiotherapy. The Female Sexual Function Index questionnaire were used to collect data of sexual activity including desire, arousal, lubrication, satisfaction, orgasm and dyspareunia. The mean age was 46.29 (SD± 7.6). The FSFI between four groups were significantly difference in desire (p 0.006), arousal (p0.003), lubrication (p0.001), and sexual satisfaction (p0.033). Mann-Whitney test is used to analyze associations between two groups. The most affected domain between radical hysterectomy and radical hysterectomy combined radiotherapy were desire (p 0.006), sexual satisfaction (0.013). Domain arousal was significant difference between radical hysterectomy and radical hysterectomy combined chemotherapy (p 0.005). Lubrication was difference between radical hysterectomy and radical hysterectomy combined chemoradiotherapy.

**Keywords**--female sexual, function index, cervical cancer, radical hysterectomy, chemotherapy, radiotherapy

## **Introduction**

Cervical cancer was the third most common cancer in female worldwide. Incidence and death rate of cervical cancer rose from age of 30-34. The number of new cervical cancer patients treated at the Gynecological Oncology Outpatient Clinic at Soetomo General Hospital in 2019–2020 was 1,488 (49.8%) cases. Radiation, chemotherapy, and radical hysterectomy may all have short- and long-term adverse effects on a woman's quality of life, including decreased sexual function. Up to 64% of survivors of gynecologic cancer did not obtain information about or counseling for post-therapy sexual dysfunction. Sexual health difficulties, according to some medical professionals, especially in Indonesia, are less essential for cancer survivors. Oncologists have generally concentrated their efforts on enhancing the overall survival of their patients. Despite the fact that sexual function is an important factor of quality of life, it is not the primary factor to be considered when suggesting cancer treatment (Huffman, Hartenbach, Carter, Rash, & Kushner, 2016; Kumbhaj, 2014).

Following a radical hysterectomy, it is common to experience orgasmic difficulties, vaginal shrinkage, dyspareuni, lymphedema, and sexual dissatisfaction. Lack of sexual interest, genital numbness, and inadequate lubrication are persistent sexual health issues (Huffman et al., 2016). According to Zhou et al study's in China, 78% of patients had female sexual arousal dysfunction. In the investigation, radiation or radical hysterectomy were the main therapies that caused sexual dysfunction. 60 percent of their participants accepted radical hysterectomy, while about 56.1% of their participants received radiotherapy. For some who have survived cervical cancer, sexuality is a major concern. Chinese cervical cancer survivors typically avoid discussing sexuality with doctors due to traditional culture (Zhou et al., 2016). There is currently no information available on the outcomes of sexual function in cervical cancer patients following radical hysterectomy, depending of whether they underwent adjuvant chemoradiation therapy. In order to carry out interventions to improve the quality of life of cervical cancer patients in terms of sexual function, it is expected that this research will serve as a resource to educate patients about the long-term impact of sexual function from the therapy to be undergone in Indonesian population.

## **Method**

### **Ethics statement**

This study was approved by the ethics committee of General Soetomo Hospital Surabaya (no. 0394/KEPK/III/2022). Informed consent was obtained from all patients.

## **Study design**

This research was an analytic observational study with a cross-sectional design. This study was carried out at Soetomo General Hospital to assess sexual function in cervical cancer patients who underwent radical hysterectomy.

## **Setting**

All cervical cancer survivors who underwent radical hysterectomy at Soetomo General Hospital between 2019 and 2021 and still had sexual partner were included in this study. They were divided into four groups: radical hysterectomy only, hysterectomy combined chemotherapy, hysterectomy combined chemoradiotherapy, hysterectomy combined radiotherapy. The Female Sexual Function Index questionnaire were used to collect data of sexual activity including desire, arousal, lubrication, satisfaction, orgasm and dyspareunia.

## **Participants**

The patients enrolled in the study had been previously treated for cervical cancer in the Gynecological Oncology Departments of Soetomo general Hospital. For inclusion, all the patients satisfied the following criteria: had received a diagnosis of cervical cancer at Stages I, II; cervical cancer treatments had ended; had normal abilities to read and write; and able and willing to sign the informed consent form. Patients were excluded whose medical records was incomplete; tumor had recurred; had no sexual partner; had mental illness or cognitive impairment. All participants were voluntary and anonymous and could quit the study at any time. All the patients filled out a self-reported questionnaire. Participants' names were replaced by numbers in the questionnaires. All data were secured and accessed only by the researchers.

## **Variables**

The variables measured in this study were sexual function according to the FSFI score which consisted of 6 domains, namely desire, arousal, lubrication, satisfaction, orgasm, and dyspareunia. These six domains are represented by the 19 questions that make up the FSFI questionnaire. The maximum score for each item is 5, and a low score denotes a lesser level of sexual function. With a cutoff of 26.55, the overall score is regarded as having a significant risk of sexual dysfunction (Pangastuti, Santoso, Agustiningsih, & Emilia, 2018).

## **Statistical Methods**

The *Kruskal-Wallis* test was used to evaluate the differences in six domains of sexual function according to The Female Sexual Function Index using IBM SPSS ver. 26.0 (IBM Corp., Armonk, NY, USA). After the *Kruskal-Wallis* test, the *Mann-Whitney* test was applied to analyse the strongest differences between the two groups. If the *p* value was less than 0.05, the probability was considered statistically significant.

## Result and Discussions

### Result

Of the total patients, 45 patients met the inclusion criteria with complete medical record data and were willing to participate in this study. The study sample consisted of 17 radical hysterectomy only patients (group 1), 12 post, 17 post radical hysterectomy + chemotherapy patients (group 2), 5 post 17 radical hysterectomy + radiotherapy patients (group 3), and 11 post 17 radical hysterectomy + Chemoradiotherapy patients (group 4) (table 1).

Table 1  
Distribution in each group

Groups	N = 45	(%)
Group 1 Radical hysterectomy	17	37,8
Group 2 Radical hysterectomy + Chemotherapy	12	26,7
Group 3 Radical hysterectomy + Radiotherapy)	5	11,1
Group 4 Radical hysterectomy + Chemoradiotherapy	11	24,4

From the characteristics of the patients, the mean age (mean) was 46.29 7.6 with the youngest age being 31 years and the oldest being 60 years. From the family's income status, it shows a general picture of the patient coming from a low economic level. Due to the patient's age at the time of the treatment, up to 24 individuals (53.3%) in this study did not have bilateral salphingoovorectomy to maintain hormonal function (table 2).

Table 2  
Demography

Characteristics	N = 45	%	Mean ± SD/ Median (min- maks)
Age (years)			*46,29 ± 7,6
Body mass inex (kg/m <sup>2</sup> )	4	8,9	
- Obesity	41	91,1	
- Non obesity			
Parity			
- Nullipara	3	6,7	
- Primipara	6	13,3	
- Multipara	36	80,0	

Comorbid		
- None	43	95,6
- Diabetes mellitus	1	2,2
- Hypertention	1	2,2
- Chronic kidney disease	0	0
Degree		
- Elementary school	13	28,9
- Junior high school	8	17,8
- Senior high school	16	35,86
- Diploma	8	17,8
Income per months		
- > Rp. 3.500.000	3	6,7
- > Rp.2.500.000-Rp. 3.500.000	3	6,7
- > Rp. 1.500.000- Rp. 2.500.000	23	51,1
- < Rp. 1.500.000	16	35,6
Stadium		
- IA	2	4,4
- IB1	17	37,8
- IB2	11	24,4
- IB3	1	2,2
- IIB	14	31,1
Starting to have sex after surgery (months)		
- No sexual activity at all	8	17,8
- <6 mos	3	6,7
- 6-12 mos	30	66,7
- >12 mos	4	8,9
BSO procedure		
- Yes	21	46,7
- No	24	53,3
Duration of evaluation in months (since last therapy)		**36 (2-64)
<hr/>		
*mean		
**median		

Each group's overall FSFI value fell below the threshold of 26.5, indicating sexual dysfunction across all groups in this study. The group that underwent radical hysterectomy in conjunction with radiotherapy received the lowest score in the domains of desire, arousal, lubrication, dyspareunia, and sexual satisfaction. The radical hysterectomy with chemotherapy group seemed to have the lowest value in the orgasm domain, respectively. The Kruskal-Wallis non-parametric test was used to compare the score of each domain between therapy groups, and it indicated significant differences in the domains of desire ( $p=0.006$ ), arousal ( $p=0.003$ ), lubrication ( $p=0.001$ ), and sexual satisfaction ( $p=0.033$ ). The overall

FSFI score ( $p=0.030$ ) also identified a significant difference. In the domains of orgasm and dyspareunia, there was no statistically significant difference ( $p = 0.307; 0.288$ ) (table 3).

Table 3  
FSFI Scores Between Treatment Groups

Domain FSFI Score	Group 1 (RADICAL HYSTERECTOMY)	Group 2 (RADICAL HYSTERECTOMY + Kemoterapi)	Group 3 (RADICAL HYSTERECTOMY + Radioterapi)	Group 4 (RADICAL HYSTERECTOMY + Kemoradioterapi)	<i>p</i>
Arousal <i>Median</i> ( <i>min-max</i> )	3,6 (1,2-4,8)	2,7 (1,2-4,8)	1,8 (1,2-2,4)	2,4 (1,8-3,0)	0,006*
Desire <i>Median</i> ( <i>min-max</i> )	3,6 (0-3,9)	2,1 (0-3,6)	1,2 (0-2,1)	2,1 (0-3,6)	0,003*
Lubrication <i>Median</i> ( <i>min-max</i> )	3,3 (0-4,5)	2,2 (0-3,6)	0,9 (0-1,8)	1,8 (0-2,4)	0,001*
Orgasme <i>Median</i> ( <i>min-max</i> )	3,2 (0-4,0)	3,0 (0-3,6)	3,6 (0-3,6)	3,6 (0-4,0)	0,307
Kepuasan seksual <i>Median</i> ( <i>min-max</i> )	3,6 (0-4,8)	3,0 (0-4,8)	1,6 (0-2,8)	2,4 (0-3,6)	0,003*
Dispareuni <i>Median</i> ( <i>min-max</i> )	4,4 (0-5,6)	3,6 (0-4,4)	1,2 (0-3,2)	2,0 (0-3,6)	0,288
Nilai total FSFI <i>Median</i> ( <i>min-max</i> )	20 (1,2-26,1)	17,4 (1,2-23,2)	12,3 (1,2-13,9)	14,9 (2,0-18,7)	0,030*

Further statistical analysis was performed in order to identify the most significant group differences in the domains of desire, arousal, lubrication, sexual satisfaction, and the overall FSFI score. The Mann-Whitney test was used to analyze the differences between the two groups, and the results showed that group 1 (radical hysterectomy) and group 3 (radical hysterectomy + radiation) had the greatest disparity in desire domains, with a  $p$  value of 0.006 between them. With a  $p$  value of 0.005, the difference between group 1 (radical hysterectomy) and group 2 (radical hysterectomy + chemotherapy) in the arousal domain was determined to be the most significant. With a  $p$  value of 0.001 in the lubricating domain, group 1 (radical hysterectomy) and group 4 (radical hysterectomy + Chemoradiotherapy) indicated the most significant difference. The group 1 (radical hysterectomy) and group 3 (radical hysterectomy + radiotherapy) differences were found to differ most significantly in the domain of sexual satisfaction, with a  $p$  value of 0.013. The group 1 (radical hysterectomy) and

group 3 (radical hysterectomy + radiotherapy) differences in the overall FSFI score were found to differ most significantly, with a p value of 0.021 (table 4).

Table 4  
The results of the post-Kruskal-Wallis test between the two groups

Treatment groups	Arousal <i>Median (min-max)</i>	Desire <i>Median (min-max)</i>	Lubrication <i>Median (min-max)</i>	Sexual satisfaction <i>Median (min-max)</i>	Total score <i>Median (min-max)</i>
Group 1	3,6 (1,2-4,8)	3,6 (0-3,9)	3,3 (0-4,5)	3,6 (0-4,8)	20 (1,2-26,1)
Group 2	2,7 (1,2-4,8)	2,1 (0-3,6)	2,2 (0-3,6)	3,0 (0-4,8)	17,4 (1,2-23,2)
p	0,11	0,005*	0,014	0,236	0,162
Group 1	3,6 (1,2-4,8)	3,6 (0-3,9)	3,3 (0-4,5)	3,6 (0-4,8)	20 (1,2-26,1)
Group 3	1,8 (1,2-2,4)	1,2 (0-2,1)	0,9 (0-1,8)	1,6 (0-2,8)	12,3(1,2-13,9)
p	0,006*	0,007	0,007	0,013*	0,021*
Group 1	3,6 (1,2-4,8)	3,6 (0-3,9)	3,3 (0-4,5)	3,6 (0-4,8)	20 (1,2-26,1)
Group 4	2,4 (1,8-3,0)	2,1 (0-3,6)	1,8 (0-2,4)	2,4 (0-3,6)	14,9(2-18,7)
p	0,019	0,015	0,001*	0,023	0,043
Group 2	2,7 (1,2-4,8)	2,1 (0-3,6)	2,2 (0-3,6)	3,0 (0-4,8)	17,4 (1,2-23,2)
Group 3	1,8 (1,2-2,4)	1,2 (0-2,1)	0,9 (0-1,8)	1,6 (0-2,8)	12,3(1,2-13,9)
p	0,159	0,211	0,131	0,177	0,20
Group 2	2,7 (1,2-4,8)	2,1 (0-3,6)	2,2 (0-3,6)	3,0 (0-4,8)	17,4 (1,2-23,2)
Group 4	2,4 (1,8-3,0)	2,1 (0-3,6)	1,8 (0-2,4)	2,4 (0-3,6)	14,9(2,0-18,7)
p	0,753	0,575	0,250	0,533	0,324
Group 3	1,8 (1,2-2,4)	1,2 (0-2,1)	0,9 (0-1,8)	1,6 (0-2,8)	12,3 (1,2-13,9)
Group 4	2,4 (1,8-3,0)	2,1 (0-3,6)	1,8 (0-2,4)	2,4 (0-3,6)	14,9 (2,0-18,7)
p	0,026	0,064	0,097	0,186	0,1

## Discussion

The quality of life of cancer patients may be affected by the long-term effects of cervical cancer treatment. As a consequence of the cervix being a reproductive organ and a characteristic of female gender identity, sexual issues are a common side effect of cervical cancer. For their quality of life to improve following cervical cancer treatment, women must be able to deal with sexual issues (Afiyanti, Wardani, & Martha, 2019). The desire, arousal, lubrication, dyspareunia, and sexual satisfaction domains showed the lowest performance in the group that underwent radical hysterectomy and radiotherapy. The group that underwent a radical hysterectomy along with chemotherapy had the lowest scores in the orgasm domain. Physical examinations in cervical cancer patients are decreased vaginal wall elasticity, vaginal mucosal atrophy, vaginal post treatment

shortening, vaginal stenosis. Reduced lubrication, insensitivity of the vagina to stimulation, dyspareunia, decreased sexual desire and excitement, inability to attain orgasm, decreased frequency of sexual intercourse, and the occurrence of vaginal hemorrhage during intercourse are other issues that frequently cause complaints.

According to Jensen's 2015 study, which involved 118 patients, persistent sexual dysfunction could be detected up to two years after radiotherapy but got improved over time. Of the patients, 85% had no sexual desire at all, 35% had less lubrication, 55% had mild to moderate dyspareunia, and 30% were dissatisfied with their sexual lives. Despite sexual dysfunction and other vaginal wall disorders, 63 percent of study participants were still engaged in sexual activity after cervical cancer therapy, while the quantity and quality of their interactions had decreased. In contrast, a study conducted in Brazil in 2015 found that 73.6% of the 71 study samples had no sex, for a diverse range of reasons including romantic partnerships, divorce after being diagnosed with cervical cancer, and a lack of knowledge about post-therapy sexual behavior (C. Corrêa, Leite, Andrade, & Guerra, 2015; Jensen & Froeding, 2015). In the lubrication domain, there was also a significant difference between groups 1 (radical hysterectomy) and 4 (radical hysterectomy with chemoradiotherapy). Reduced lubrication and pain during sexual activity are side effects of radiotherapy as well as ovarian failure caused by various treatments, including radical hysterectomy, chemotherapy, and radiotherapy. Damage and ovarian failure affect fertility and early menopause, which decreases estradiol levels and affects an individual's ability for orgasm and other sexually stimulating experiences including arousal and desire (C. Corrêa et al., 2015).

According to the findings of qualitative interviews with researchers, the majority of patients acknowledged that they were not briefed about how cervical cancer therapy would affect their sexual lives. This is due to through Indonesian culture, it is considered taboo to discuss issues relating to sexual function. As a result, complaints of sexual dysfunction in cervical cancer patients are not taken seriously. Contrary to the situations in developed countries, sexual function is a crucial aspect of a woman's quality of life; with a longer life expectancy, it is essential to have a quality sexual life. Considering that sexual function is an important factors that affect a woman's quality of life, this decrease in sexual function should be assessed and used as counseling material for clinical service providers in the field of cancer. Before and after receiving treatment, cervical cancer patients need to have this decrease in sexual function discussed with them since they will be more capable of coping with their disease situations if they are aware of the possibility of adverse effects. Following the Hassan et al. study from 2021, discussing to patients about their risk of sexual dysfunction helps them improve the quality of their sexual life after completing various cervical cancer treatment modalities (C. S. L. Corrêa et al., 2016; Hassan, Kamal, S, & Ali, 2021).

The biological, psychological, social, and environmental factors that interact to produce sexual function were not quantitatively explored in this study, but they certainly interact to establish sexual function. Additionally, it is challenging to gather information about the complaints cervical cancer patients have had about



their sexual activity, making it difficult to assess sexual function in the Indonesian population. Another limitation of this study is that there was no assessment of the patient's sexual function prior to either diagnosis or therapy, thus it is unknown whether the patient had previously had sexual dysfunction.

## Conclusion

There were differences in sexual function between treatment groups in the domains of desire, arousal, lubrication, sexual satisfaction, and overall FSFI scores. The post radical hysterectomy only group had the highest FSFI scores for the domains of desire, arousal, lubrication, and sexual satisfaction.

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