








ORIGINAL ARTICLE

EFFECTS OF BRACHYTHERAPY ON QUALITY OF LIFE AND FUNCTIONALITY IN THE TREATMENT OF CERVIX CANCER

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ABSTRACT

Objective: to assess the effect of brachytherapy on functionality and quality of life of women with cervix cancer. **Method:** a descriptive and cross-sectional study carried out between December 2019 and February 2020 with 33 women with uterine neoplasia undergoing brachytherapy, followed up at Centro Oncológico do Nordeste - Brazil. The Functional Assessment of Cancer Therapy – Cervix Cancer instrument was applied. The means of the subscales were compared and their mutual correlation was analyzed by applying the ANOVA and Student's t tests. **Results:** requirements focused on self-image, sexuality and urinary complaints were evidenced. The mean of additional concerns was lower in the age group from 50 to 59 years old, when compared to the mean values in the age groups from 31 to 49 years old ($p=0.004$) and from 60 to 75 years old ($p=0.002$). **Conclusion:** addressing issues related to sexuality and urinary complaints contribute to early identification of the symptoms caused by brachytherapy, as well as the implementation of measures, providing quality of life for the patient.

DESCRIPTORS: Cervix Neoplasms; Women's Health; Oncology; Brachytherapy; Quality of Life.

HOW TO REFERENCE THIS ARTICLE:

Corpes E de F, Gonçalves G dos A, Oliveira ACA, Pacífico V da S, Castro RCMB, Almeida PC de, et al. Effects of brachytherapy on quality of life and functionality in the treatment of cervix cancer. *Cogitare Enferm.* [Internet]. 2022 [accessed "insert day, month and year"]; 27. Available from: dx.doi.org/10.5380/ce.v27i0.86926

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INTRODUCTION

Cervix cancer is considered the third most incident type of cancer in the female population, only behind breast and colorectal cancer. The number of new cases of cervix cancer expected in Brazil for each year of the 2020-2022 triennium will be 16,590, with an estimated risk of 15.43 cases per 100,000 women¹.

Screening is performed through the cytopathological examination, known as Pap smear, which should be started at age 25 in women who have already initiated their sexual life, and be done until the age of 64, once a year and, after two consecutive negative annual examinations, every three years². After diagnosis, the health professional must design an individualized treatment according to the patient's needs, age, stage of the disease and tumor size.

Advances in health technologies have allowed the implementation of techniques that aim at improving the overall survival rates and progression-free survival among these patients, with antineoplastic chemotherapy, radiotherapy and surgery as the main forms of treatment, which can be performed individually or concomitantly³.

High Dose Rate (HDR) Brachytherapy is one of the radiotherapy modalities increasingly used in the treatment of cervix cancer, performed through endovaginal applicators that direct the radioactive source as close to the tumor as possible, preserving healthy tissues⁴. During this procedure, it is necessary that the patient is in gynecological position. When necessary, analgesic or sedative medications are used to avoid or reduce discomfort.

Brachytherapy has several side effects, such as nausea, diarrhea, fatigue, urinary problems, stenosis and vaginal dryness, among others, and these symptoms can influence activities of daily living and, consequently, reduce the quality of life of these patients. In view of this, it is fundamental to know and implement strategies that promote the quality of life and functionality of these women, aiming not only at healing, but also at their biopsychosocial well-being⁵.

For this, there are several instruments that allow measuring the patients' quality of life and functionality and, through the results, facilitate development and implementation of health strategies. The Functional Assessment of Cancer Therapy - General (FACT-G) was an instrument developed and validated in 1993, being the first scale that scores and measures the health-related quality of life of people with chronic diseases. After its creation and validation, various scales targeted at specific types of cancer were developed, such as cervix, prostate and intestinal, among others⁶.

For cervix cancer, the Functional Assessment of Cancer Therapy – Cervix Cancer (FACT-Cx) is used, which assesses the patient's quality of life, functionality and satisfaction, referring to the last seven days of treatment. This instrument includes questions aimed at the following domains: physical, social/family, functional, emotional well-being and items related to the additional concerns domain, which assesses specific symptoms in the gynecological area, vaginal changes, urinary and intestinal problems, concern with treatment, food, self-image and sexuality⁶.

As brachytherapy is an invasive and painful treatment with various side effects, many women can experience pain, suffering and fear. Consequently, the objective of this study was to assess the effect of brachytherapy on functionality and quality of life of women with cervix cancer.

METHOD

An analytical cross-sectional study developed with 33 women diagnosed with cervical cancer, submitted to brachytherapy treatment, under follow-up at Centro Especializado em Oncologia do Nordeste from December 2019 to February 2020.

The following inclusion criteria were applied: age equal to or greater than 18 years old; cervix cancer diagnosis; having undergone Teletherapy with subsequent indication of brachytherapy. The following were considered as exclusion criteria: women who have been previously subjected to brachytherapy or performance status of the Eastern Cooperative Oncology Group (ECOG) > two; previous or current history of other tumors; and impairment of cognitive ability.

Data collection took place at the radiotherapy outpatient service, in which the women were interviewed after the third application of brachytherapy, using a structured form. The data collection instrument was divided in two parts, namely: a form with sociodemographic data and the FACT-Cx instrument, version 4.0. Use of FACT-Cx was granted through authorization of the institution that holds the due copyright⁶.

The FACT-Cx instrument consists of 42 items, 27 of which are grouped into the physical, social/family, functional and emotional well-being, and 15 specific to cervix cancer⁶. The items follow a Likert scale, with scores varying from zero to four. Data analysis was performed by applying statistical tests. The means of the subscales were compared according to the sociodemographic variables by using the Student's t and ANOVA tests, and their mutual correlation was analyzed through Pearson's r.

The research was authorized by the Research Ethics Committee (Comitê de Ética e Pesquisa, CEP), under consubstantiated opinion No. 3,766,639.

RESULTS

In relation to the sociodemographic characteristics, the mean (\pm SD) age was 54.6 ± 12.8 years old, with predominance of the age group from 60 to 75 years old (45.5%). Of the women interviewed, 20 (60.6%) had complete Elementary School and another 20 (60.6%) were housewives. Regarding marital status, 18 (54.5%) did not have a partner and 18 (54.5%) had up to three children (Table 1).

Table 1 – Distribution of the number of women according to age group, marital status, number of children and occupation. Fortaleza, CE, Brazil, 2019

Characteristic	n	%	Mean \pm SD
Age group (years old)			55.6 \pm 12.8
31 – 45	10	24.2	
46 – 59	8	30.3	
60 – 75	15	45.5	
Schooling			
Literate	7	21.2	
Elementary School	20	60.6	

High School	6	18.2
Marital status		
Has a partner	15	45.5
No partner	18	54.5
No. of children		4 ± 1.2
Up to 3	18	54.5
4+	15	45.5
Occupation		
Housewife	20	60.6
Other	13	39.4

Source: The authors (2021).

When comparing the means of the total FACT-Cx scores and its subscales with their respective midpoints (Table 2), it was found that the means were higher than the value determined by the midpoint, except for the functional well-being subscale, whose mean (15.5) was similar to its midpoint (14) ($p=0.108$).

Table 2 - FACT-Cx scores and subscales of the women subjected to brachytherapy. Fortaleza, CE, Brazil, 2019

Variable	Mean ± SD	Midpoint	
Physical well-being (PWB)	17.2 ± 6.2	14	0.005*
Social/Family well-being (SWB)	19.3 ± 5.7	14	<0.0001*
Emotional well-being (EWB)	17.2 ± 5.3	14	0.001*
Functional well-being (FWB)	15.5 ± 6.1	14	0.108*
Additional concerns (CxCs)	37.5 ± 8.4	30	<0.0001**
FACT-Cx total	107 ± 20.7	86	<0.0001**

Source: The authors (2021).

*Student's t test for a sample.

**ANOVA test to compare all four well-being subscales.

In the additional concerns domain, 27 (82.8%) women stated being completely uninterested in sex and 12 (35%) indicated being very/extremely afraid of engaging in sexual relationships. Of the interviewees, 23 (69.6%) reported not feeling at all attractive and 12 (36.6%) chose the "not at all" option when asked if they liked their body image.

As for urinary complaints, 16 women (48.5%) answered More or less and Very much/Extremely in relation to difficulty controlling their urine, with 21 (63.6%) of the interviewees choosing More or less and Very much/extremely in relation to burning sensation when urinating and 19 (57.6%) reporting some discomfort when urinating (Table 3).

Table 3 - Aspects related to the additional concerns subscale. Fortaleza, CE, Brazil, 2019

Variable	n	%
I am interested in sex		
Not at all/A little	27	82.8
More or less	2	6.9
Very much/Extremely	4	10.3
I am afraid of having sexual relationships		
Not at all/A little	19	57.2
More or less	2	7.1
Very much/Extremely	12	35.0
I feel sexually attractive		
Not at all/A little	23	69.6
More or less	5	15.4
Very much/Extremely	5	15.4
I like my body image		
Not at all/A little	12	36.6
More or less	7	20
Very much/Extremely	14	43.3
Difficulty controlling urination		
Not at all/A little	17	51.5
More or less	6	18.2
Very much/Extremely	10	30.3
Burning sensation when urinating		
Not at all/A little	12	36.4
More or less	8	24.2
Very much/Extremely	13	39.4
I feel uncomfortable when urinating		
Not at all/A little	14	42.5
More or less	4	12.1
Very much/Extremely	15	45.5

Source: The authors (2021).

When comparing the means of the FACT-Cx subscales according to the socioeconomic variables, it was found that the mean of additional concerns was lower in the age group from 50 to 59 years old when compared to the mean from 31 to 49 years old ($p=0.004$) and with that of 60-75 years old ($p=0.002$); in terms of physical well-being, the mean corresponding to Housewife was higher than that of Other occupation ($p=0.002$) (Table 4).

Table 4 – Comparison of the means of the FACT-Cx scale according to the sociodemographic variables. Fortaleza, CE, Brazil, 2019

Variable	n	Mean ± SD	p-value
Additional concerns (CxCs)			
Age group	31-49	10	37.9 ± 6.5 ^a
	50-59	8	29.8 ± 8.0 ^b
	60-75	15	41.4 ± 7.4 ^a
Occupation (FWB)			
Marital status	Single/Widow/Divorced	18	14 ± 6.8
	Married/Stable union	15	17.9 ± 4.5
Physical well-being (PWB)			
Occupation	Housewife	20	19.8 ± 5.4
	Other	13	13.2 ± 5.2

Source: The authors (2021).

*ANOVA test;

**Student's t test.

The analysis of the correlation between the subscales evidenced the existence of a directly proportional correlation between social/family well-being and emotional well-being ($r=0.43$; $p=0.013$), between physical well-being and functional well-being ($r=0.43$; $p=0.013$) and between physical well-being and additional concerns ($r=0.59$; $p<0.001$) (Table 5).

Table 5 – Correlation between the scores of the FACT-Cx subscales. Fortaleza, CE, Brazil, 2019

Variable	Pearson	p-value
Social/Family well-being and Physical well-being	0.10	>0.05
Social/Family well-being and Emotional well-being	0.43	0.013
Social/Family well-being and Functional well-being	0.16	>0.05
Social/Family well-being and Additional concerns	-0.37	>0.05
Physical well-being and Emotional well-being	0.15	>0.05
Physical well-being and Functional well-being	0.43	0.013
Physical well-being and Additional concerns	0.59	<0.001
Additional concerns and Functional well-being	0.28	>0.05

Source: The authors (2021).

DISCUSSION

The mean age in this study was 55.6 ± 12.8 years old. A similar result was found in a study carried out in Pernambuco - Brazil, which evaluated the profile of women undergoing treatment for cervix cancer from 2014 to 2016 and evidenced a mean age of 50.6 years old⁷.

The increase in age is considered as an important risk factor for the development of cervix cancer, being more common in the age group from 50 to 60 years old¹. In this study, there was a higher concentration of uterine cancer in women aged between 60 and 75 years old, which can suggest that some of these women may not have been included in the screening program, as the recommendation for cervix cancer screening occurs between the ages of 25 and 64.

The difficulty accessing the health system, as well as the myths and taboos referring to the exam, also contributed to low adherence to the screening method. The schooling level can also exert a direct influence on early diagnosis, as the more information and knowledge is provided to the population, the greater the search for and adherence to the prevention and health promotion methods.

The predominant schooling level in this study was Elementary School, reported by 20 women (60.6%). A survey carried out from 2000 to 2013 in a tertiary-level hospital in São Paulo - Brazil, pointed to schooling as one of the main factors for cervix cancer involvement, as the higher the schooling and clarification levels, the lower will be these women's exposure to risk factors⁸.

When analyzing the FACT-Cx scores, it was observed that it does not allow for a cutoff value to classify Health-Related Quality of Life (HRQoL). Thus, the scores were analyzed separately and it was possible to observe that the functional, physical and emotional well-being domains obtained the farthest means from the maximum score of each domain. A study carried out in 2011 in Recife, Brazil, used the same scale in women undergoing treatment for cervix cancer and justified the disparity in the means because the test was applied in the last week of treatment, when the patients are more symptomatic and fragile⁹.

When analyzing the issues related to sexuality, it is possible to observe that the number of women who are not interested in sex and do not feel attractive is high, although the number of women who stated that they were afraid of having sex is considered low when compared to those who are not afraid of engaging in sexual relationships. The side effects of the cervix cancer treatment can increase sexual dysfunction and, consequently, exert effects on these women's quality of life.

A study carried out in a tertiary-level hospital in Recife, Brazil, pointed out that sexual dysfunction was present among the participants, with fear and dyspareunia as the main reasons¹⁰. Therefore, these and other effects must be discussed and clarified before and after treatment, in addition to implementing measures that can alleviate discomfort during sexual activities, in order to improve these women's quality of life.

When addressing body image, it was possible to notice that the women participating in this study do not feel attractive and/or do not like their body image. Such feelings are frequent in women undergoing cancer treatment, especially breast and cervix cancer, as there are many stigmas for the female population related to the weight of the body image that is placed on these women and to the sexualization and sensualization of body parts, such as breasts and hair. Consequently, when these parts undergo changes, women tend to feel less attractive.

The changes in body image and their repercussions can be directly related to the psychological, social and spiritual components. A study carried out in 2017 in Florianópolis - Brazil, which aimed at addressing the impacts caused by brachytherapy, asserts that the impacts felt on body image and self-esteem can occur quickly and uncontrollably, which can cause difficulties dealing with the new appearance and the fear of other people's judgments¹¹.

In the current study, the urinary complaints most frequently mentioned by the patients were difficulty, burning sensation and discomfort when urinating. These side effects are mainly caused by the treatment modality, which contributes to the involvement of changes in the function of the pelvic organs and their support structures¹². Brachytherapy allows for

better protection of the adjacent organs when compared to External Teletherapy, with the possibility for this to be the main cause of these symptoms.

When comparing the means of the FACT-Cx scale with the sociodemographic variables, those with $p < 0.05$ were considered as significant results. Therefore, it was possible to observe that there is no association between the FWB groups and marital status ($p > 0.069$), evidencing that marital status has no significant influence on the functional well-being of the group under study.

However, the alternative hypothesis was accepted between CxCs and age group ($p < 0.004$), showing that there is an association between them. Therefore, when evaluating the mean ages separately, it is possible to show that the older the age group of women undergoing brachytherapy treatment, the more frequent additional concerns may be, such as dysuria, discomfort when urinating, difficulty controlling urination, conceptions about self-image and sexuality.

Such symptoms can be more noticeable in this age group (60 - 75 years old) due to changes in body physiology such as menopause, decreased production of hormones (estrogen and progesterone) and vaginal lubrication, in addition to the effects already caused by possible treatments performed prior to brachytherapy. These factors can contribute to the increase in the number of additional concerns manifested by these patients.

The alternative hypothesis was also considered between the PWB and occupation groups ($p < 0.002$), showing that women who carry out their activities at home (housewives) have better physical well-being when compared to those who perform some external activity. This circumstance can be related to multitasking by women since many of them, in addition to working, need to reconcile house chores, children and relationships, attributing to them a complex network of domestic, family and professional responsibilities. Although work is considered a great achievement for the female population, in many families the domestic task is still reserved exclusively for women, causing physical, emotional and social burden¹³.

When the subscales were mutually correlated, it was possible to notice a low association of Social/Family well-being with Physical and Functional well-being and with Additional concerns. In this study, there was a moderate association between social and emotional well-being (0.43), showing that cervix cancer can influence social relationships and, consequently, impact on emotional well-being. Cervix cancer can cause a lot of stigma and fear of judgment because the disease is associated with a sexually transmitted virus, leading to feelings of social inadequacy for needing to be absent from daily activities, anxiety, stress and insecurity¹⁴.

Physical well-being is related to the side effects caused by the treatment, such as nausea, pain, feeling without energy and difficulty meeting daily needs, while functional well-being is associated with work, activities of daily living, sleep and quality of life. In the current study, when the correlation between physical and functional well-being was evaluated, they obtained a moderate association (0.43), showing that physical well-being directly influences functionality and that these variables can also be influenced by age, stage of the disease, pre-existing comorbidities, performance status, and medication use by the patient¹⁵.

Also regarding physical well-being, it had a positive and high correlation when associated with additional concerns (0.59), showing that the greater the physical well-being, the more the additional concerns. However, it is known that high physical well-being directly influences quality of life, and its association with additional concerns should be inversely proportional. Therefore, the result obtained in this category may have been a consequence of the sample size, and this value should be considered with caution.

To confirm this finding, a study carried out in a tertiary-level hospital from 2015 to 2016 evaluated the women's quality of life after cervix cancer treatment and showed that

the physical domain exerted more influence on quality of life, evidencing that the greater the physical harms, the worse the quality of life¹⁶.

Studying HRQoL and functionality has become necessary, especially in the face of a disease that impacts women's lives such as cervix cancer, considering the repercussions caused by the disease and its treatment. Therefore, performance of the multi- and interdisciplinary teams is essential to identify the main demands of these women and design an individualized care plan in order to alleviate the side effects caused by brachytherapy.

This study presents some limitations that may have exerted an influence on the results. The first is related to the small sample, which had to be reduced due to the collection locus, thus limiting possible conclusions and extrapolations to larger target populations. The impossibility to conduct the study at two moments (pre- and post-treatment) may have hindered the assessment of quality of life. In addition to that, the scarcity of studies in the literature that assess HRQoL during brachytherapy treatments hinders a direct comparison of the findings.

CONCLUSION

In the current study, it was possible to identify an association between some categorical and sociodemographic variables (additional concerns and age; physical well-being and occupation), as well as a correlation between the subgroups studied. Such findings allow us to conclude that brachytherapy treatment exerts significant impacts on women's lives, especially when related to sexuality, self-image and urinary complaints, directly influencing these patients' quality of life and functionality.

This reinforces the need for the multiprofessional team to address issues related to sexuality and urinary complaints during the appointment, as these were the main demands found in the study. Adoption of these measures in Nursing consultations with patients with cervix cancer undergoing brachytherapy contributes to early identification of the signs and symptoms caused by the therapy, as well as clarification of doubts, with the additional possibility that nurses develop measures to prevent and early intervene in the side effects caused by brachytherapy.

For future studies, larger samples and application of the instrument in the pre- and post-treatment period are indicated, in order to enable a better relationship between the findings and the instrument applied. Studies that assess HRQoL should be increasingly implemented for cancer patients, as this disease causes significant changes in the patient's everyday life and biopsychosocial well-being.

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Received: 11/05/2021
Approved: 02/03/2022

Associate editor: Tatiane Herreira Trigueiro

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ISSN 2176-9133



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