

Effects of belly dancing intervention on sexual function and body image in breast cancer patients undergoing hormone therapy - randomized clinical trial

Efeito da dança do ventre na função sexual e imagem corporal de pacientes em hormonioterapia para o câncer de mama - ensaio clínico randomizado

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Abstract

Introduction: Breast cancer is a public health problem because of its high incidence. Its often-mutilating treatment can cause serious problems with regard to body image and sexual function in these women. Belly dancing is a possible option to improve the femininity of these women. **Objective:** The aim of this two-arm randomized study was to determine the effect of practicing belly dancing on sexual function and body image in breast cancer patients undergoing adjuvant hormone therapy in Santa Catarina, Brazil. **Methods:** The study randomized 24 women (60 ± 10.4 years old) diagnosed with breast cancer, 11 in the intervention group (IG) and 13 in the control group (CG). A questionnaire was used to evaluate personal and clinical characteristics, body image (BIBCQ), and sexual function (FSFI). **Results:** On the body image scale, in the domains of body stigma ($p = 0.002$) and body concerns ($p = 0.017$), significant intergroup differences were found, with better body image for the IG in the post-intervention period when compared to the CG. In sexual function, no significant differences were found. **Conclusion:** Belly dancing as physical exercise helps improve body image in patients with breast cancer undergoing adjuvant treatment with hormone therapy.

Keywords: Body image. Breast cancer. Dancing. Sexuality.

Resumo

Introdução: O câncer de mama é um problema para a saúde pública devido ao alto número de incidência. Seu tratamento muitas vezes mutilador pode trazer sérios problemas na imagem corporal e na função sexual dessas mulheres. A dança do ventre vem como uma opção passível para melhorar a feminilidade dessas mulheres. **Objetivo:** Analisar o efeito da prática da dança do ventre na função sexual e na imagem corporal de pacientes em tratamento adjuvante de hormonioterapia para o câncer de mama em Santa Catarina. **Métodos:** O ensaio clínico randomizado de dois braços foi realizado com 24 mulheres (60 ± 10,4 anos) diagnosticadas com câncer de mama, sendo 11 no grupo de intervenção (GI) e 13 no grupo controle (GC). Utilizou-se um questionário avaliando características pessoais e clínicas, imagem corporal BIBCQ e função sexual FSFI. **Resultados:** Na escala de imagem corporal, nos domínios estigma corporal ($p = 0,002$) e preocupações com o corpo ($p = 0,017$), foram encontradas diferenças significativas intergrupo, com melhor imagem corporal para o GI no período pós-intervenção quando comparado ao GC. Na função sexual não foram encontradas diferenças significativas. **Conclusão:** Percebe-se a importância do exercício físico como a dança do ventre a fim de auxiliar na melhora da imagem corporal de pacientes com câncer de mama em tratamento adjuvante com hormonioterapia.

Palavras-chave: Imagem corporal. Neoplasias da mama. Dança. Sexualidade.

Introduction

Breast cancer was one of the most common cancers worldwide in 2020,¹ with approximately 2.2 million new cases, making it a major health problem.² For Brazil, 66,280 new cases are predicted for the biennium 2020/2022, with the southern region of the country having the highest rate of new cases.³

Therefore, the treatments are of paramount importance, with surgery as the main one, supplemented with chemotherapy, radiotherapy, hormone therapy and target therapy, which can be administered jointly and complementarily. The choice depends on disease status, the type of tumor and the general health condition of the patient.^{4,5} Despite the good cure rates, these multifactorial treatments contribute to the prolongation of the medical intervention's period, during which

adverse side effects are observed,⁵ including those related to body image and sexuality.⁶

Sexuality is one of the areas most affected by breast cancer treatment, where patients show lower levels of function and sexual satisfaction,⁷ having a negative impact on quality of life.^{4,7-9} These women with sexual dysfunction display physical and emotional dissatisfaction, with feelings of unhappiness¹⁰ and depression,^{9,11,12} and experience pain during sexual intercourse¹³ and vaginal dryness^{8,9,14} as most prevalent symptoms.

Just as changes in body image can be predictors for these sexual problems,^{7,9} they are associated with mastectomy, weight gain,⁹ hair loss, scarring and fatigue.⁸ Fatigue can be aggravated by lack of physical exercise, which also intensifies physical exhaustion and loss of muscle strength.⁵ Moreover, weight gain¹⁵ with unbalanced distribution¹⁶ and hair loss cause a negative self-assessment,¹⁷ as well as the scars left by mastectomy.¹⁸

Physical exercise provides important benefits for patients with breast cancer, especially in the mobility of the shoulder girdle and upper limbs.¹⁹ In addition, it improves quality of life and reduces fatigue symptoms.²⁰ One of the physical practices that is of benefit to patients is dancing, which helps in improving the strength and amplitude of the upper limbs.²¹ Besides, it rescues the will of living,²² improves quality of life,²¹ brings self-esteem and vitality²³ and improves body image,²¹ beyond reducing stress and pain²⁴ and factors associated with obesity and inflammation.²⁵

Belly dancing is as an option that can be performed by women of all ages and physical types,²⁶ because it allows the exploration of sensuality and creative freedom,²⁷ in addition to contributing to flexibility, working on femininity and increasing self-esteem and consequently sexual activity.²⁶ Sensuality is awakened with belly dancing, as well as sexuality, making the woman more relaxed and freer with herself and, later, for relationships.²⁷ In the aspect of femininity, it is an important influential concept in body image,²⁸ where the breast is a symbol for women and their femininity for society. The study by Boing et al.²⁹ showed the positive effect of belly dancing for women with breast cancer on quality of life, fatigue and depressive symptoms.

Therefore, the aim of this study was to determine the effect of the practice of belly dancing on sexual function and body image in breast cancer patients undergoing adjuvant hormone therapy.

Methods

In this study, 24 women (60 ± 10.4 years) diagnosed with breast cancer and undergoing adjuvant hormone therapy were allocated at the Cancer Research Center (CEPON - Centro de Pesquisas Oncológicas) in Florianópolis, Santa Catarina. The study was approved by the Ethics Committee on Research in Human Beings of the Universidade do Estado de Santa Catarina (UDESC; protocol 2,073,549) and the Ethics Committee of the Cancer Research Center (protocol 2,319,138), and registered in the platforms Clinical Trial Registration (NCT03194997) and Universal Trial Number (U1111-1195-1623). All participating women signed an informed consent form for inclusion in the research project.

This randomized two-arm clinical trial analyzed the preliminary results of the MoveMama study.³⁰ For this study, the sample consisted of two groups: a) belly dancing intervention and b) control group, and both groups were allocated using the randomness technique.³¹ The participants' recruitment was through lists made available by CEPON, of women undergoing adjuvant hormone therapy. All of them received two attempts to contact by telephone, where they were invited to participate in the study. Both groups received a personalized T-shirt of the project, as a way of identifying the participants and their inclusion.

Inclusion criteria were age above 18 years, clinical status I to III of breast cancer, being in treatment with hormone therapy, and permission to practice physical activity from the responsible oncologist or release from the physiotherapy sector of CEPON. Exclusion criteria were physical limitations (orthopedic or neurological) for the practice of physical activity and in participation in the collection of pre- and post-intervention data, and frequency less than 50% in the belly dancing classes of the intervention group.

The sample size's calculation was performed using the Software G*Power 3.1.9.2,³² weighting the sexual function as the primary outcome of the study, based on the work by Boing et al.³⁰ who reported a 23% change in sexual function in the IG and -4% in the CG, with significance level of 5% and test power of 95%. With these parameters, a minimum of 28 patients was needed for the study, requiring 14 patients for each group.

Randomization and blinding were performed by researchers from the Laboratory of Research in Leisure and Physical Activity (LAPLAF/CNPq), based on a

document provided by CEPON with a list of patients (stage I-III) who started adjuvant hormone therapy ($n = 662$) between 2015 and 2017 at CEPON/SC. Thus, the patients were invited by telephone to participate in the study, explaining the involvement of physical activity (dancing) and the application of questionnaires. The allocation in both groups (IG and CG) of the women who agreed to participate in the study was carried out by lot, using www.randomization.org. Blinding occurred in relation to data analysis, in which the researcher who performed the data analysis was not informed about the allocation of women in the groups.

Control group

The women selected for CG were asked to maintain their normal activities, and they were contacted twice by telephone (July and September 2018) to maintain follow-up and identify possible changes in relation to the practice of exercise. Educational actions were carried out during 16 weeks with the control group, with three 60-minute lectures on women's health and instruction of movements for upper limbs.

The first lecture took place one week after the beginning of the intervention (June 2018), with seven participants present, who received guidance on active upper limb movements by the researchers. In the eighth week after the beginning of the intervention (August 2018), the second lecture was attended by five women on self-esteem and body image, with reports from another participant who had already undergone similar experiences. Finally, the third lecture took place in the 16th week (September 2018), with 10 participants, with the theme of lymphedema prevention, held by a physiotherapist specialized in the subject.

In addition, a booklet on the benefits of physical activity was given, with the purpose of initiating the practice of physical exercise after the study. At the end of the research, the CG participants were invited to participate in a Health and Sports Center (CEFID)/UDESC dance extension project aimed at women with breast cancer.

Intervention group

The women drawn for IG participated in 16 weeks of belly dancing classes three times a week at CEPON. The structure of each class was divided into three

parts: 1) warm-up and stretching, 2) main part and 3) relaxation, according to the protocol of Boing et al.³⁰ The rhythm and intensity of the classes were planned and progressively defined by the beats per minute (bpm) of the songs.³³ For the first part, slower songs up to 80 bpm were used for the sequence of broad joint movements for 10 minutes. The joint actions attended were flexion, extension, abduction, adduction and rotation, starting from the upper body until reaching the lower limbs, thus developing motor coordination and body awareness and improving the range of motion of the upper limbs. This part was also worked on in the main stage of the class, in addition to basic scans of rhythm and the explanation of the objective of the session, followed by the practical part of teaching the step technique.

The dynamics of the class was individual, in pairs or in group, guided by the rhythm of the music, in which the participant was not obliged to follow, respecting limits and expression of feelings. For this, medium to fast music (120 to 150 bpm) was used. The average duration of this part was 40 minutes. For relaxation, lasting 10 minutes, the rhythm of the music was decreased to 120 bpm, with slow movements for heart rate normalization. To end and conclude the session, a discussion round was held about the students' perception of the class given.

The IG women adherence was determined as follows: number of sessions attended/48 sessions planned $\times 100$,³⁴ and the number of sessions attended was recorded by the researcher during the intervention period. In this study, three questions were evaluated: personal and clinical variables, sexual function, and body image.

Personal and clinical variables: anthropometric measurements, with height being obtained using a fixed stadiometer on the wall (Sanny, height of 2.0 m and scale of 0.1 cm), and body composition using a digital scale (Toledo, model 2096 PP, capacity of 200 kg and resolution of 50 g). Body mass index was determined by dividing weight (kg) by height (m) squared. The BMI classification was made for better analysis of the results, considering normal weight BMI to be 18.5 to 24.9 and overweight BMI ≥ 25 . The socioeconomic variables analyzed were age, education, profession, marital status and economic level. The economic level was characterized as: upper class (A and B), middle (C) and low (D and E). This classification was according to IBGE, in addition to the monthly salary of 2018 of R\$954.00.

Clinical variables such as previous treatment, type of hormone therapy, recurrence, presence and symptoms of lymphedema, characteristics of surgical intervention (conservative/total/bilateral), breast reconstruction (late/immediate/unperformed), emptying (axillary/sentinel lymph node) and urinary incontinence.

Sexual function: the Female Sexual Function Index (FSFI) was used, which had been validated, translated and culturally adapted by Thiel et al.,³⁵ with a Cronbach's alpha of 0.98. For cancer patients, it was validated internationally with a coefficient of 0.70.³⁶ The FSFI consists of 19 items separated into six scales: desire (questions 1 and 2), arousal (3 - 6), lubrication (7 - 10), orgasm (11 - 13), satisfaction (15 and 16) and pain or discomfort (17 - 19). To calculate the final score, each scale is summed and multiplied by a specific value according to the domain: desire - 0.6; excitation - 0.3; lubrication - 0.3; orgasm - 0.4; satisfaction - 0.4; and discomfort/pain - 0.4. The score is obtained by the sum of the items of each domain, ranging from 2 to 36 points, in which the highest score implies a better sexual function.

Body image: Body Image After Breast Cancer Questionnaire (BIBCQ) is a questionnaire created by Baxter et al.,³⁷ translated, validated and culturally adapted by Gonçalves et al.,³⁸ with the objective of analyzing the impact of breast cancer on body image. It consists of 44 Likert questions divided into six scales, with the score varying between domains: vulnerability (8 to 45 points), body stigma (10 to 65), limitations (6 to 30), body concerns (6 to 30), transparency (5 to 30) and arm concerns (3 to 15). For the result, the higher the score achieved by the patient, the more compromised was the body image evaluated.

Data collection was performed at the Health and Sports Center (CEFID) of the State University of Santa Catarina (UDESC), with an approximate duration of 30 minutes, and was carried out by a team of LAPLAF/CNPq researchers duly trained, with a time and date previously scheduled with the patients. For the statistical analysis of the results, the SPSS program - version 20.0 was used. The personal and clinical characterization of the participants was verified using Fisher's exact test. For the results of body image and sexual function, the paired t-test and the Wilcoxon test were used, after demonstrating normality by the Shapiro-Wilk test. In the intergroup analysis, the t-test for independent samples and the Mann-Whitney U test were used. A significance level of 5% was used.

Results

Figure 1 shows the flowchart for the selection of women for the study. Table 1 presents the personal and clinical characterization of the study participants, showing a homogeneity between the groups, with significant difference only for the reconstruction variable ($p = 0.012$).

Significant intergroup differences (Table 2) were found in the domains body stigma ($p = 0.002$) and body

concerns ($p = 0.017$), showing better body image for IG in the post-intervention period in these two scales when compared to CG. There were also significant effects in the intragroup analysis for IG in the domains of body stigma ($p < 0.001$) and body concerns ($p < 0.001$) in the comparison between the pre- and post-intervention periods. The adherence of the participants was 67.8%. In sexual function, presented in Table 3, no significant differences were observed in the intra- and intergroup analysis.

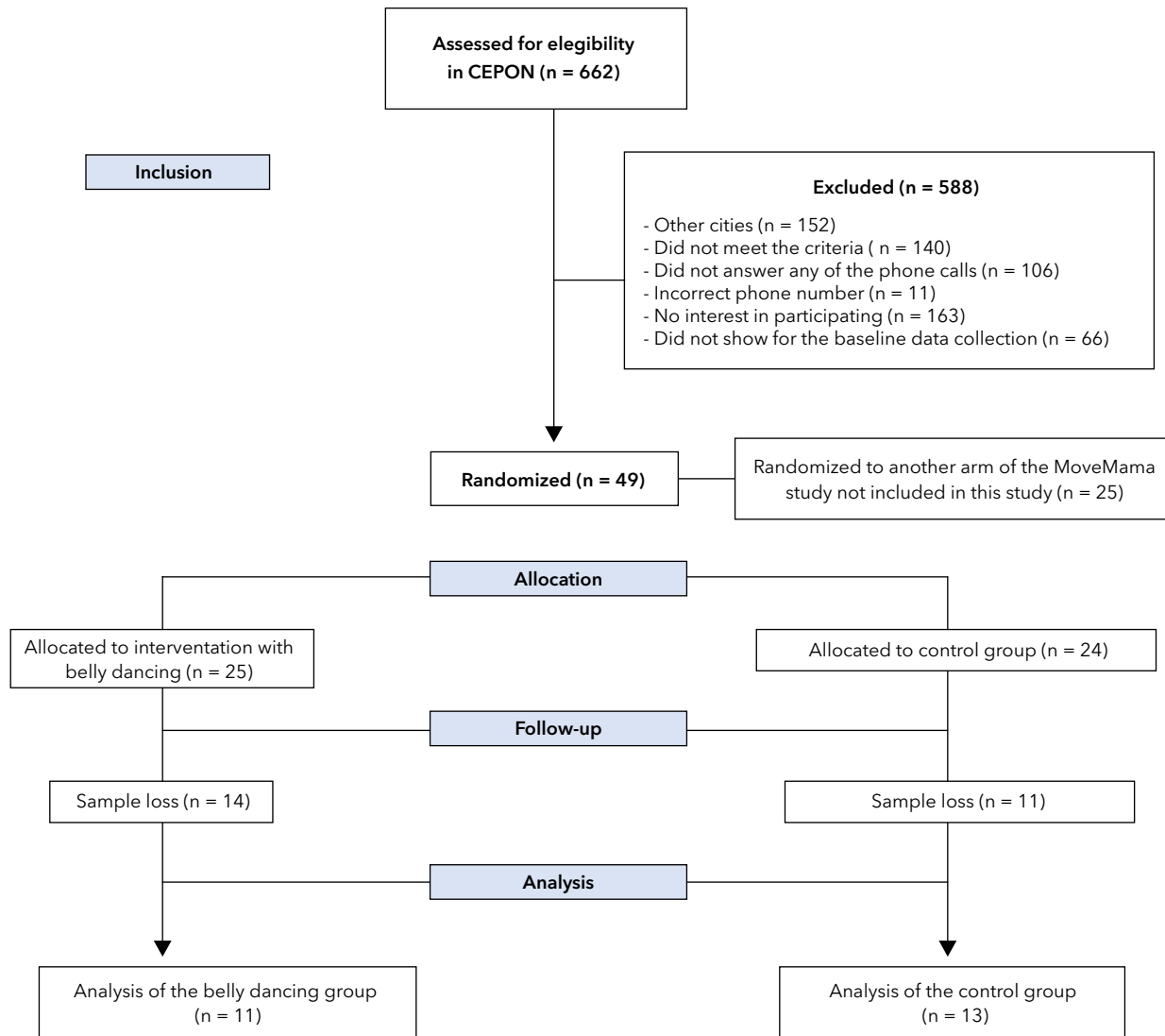


Figure 1 - Flowchart for women's selection for the randomized clinical trial.

Note: CEPON = Centro de Pesquisas Oncológicas (Cancer Research Center), Florianópolis, SC, Brazil, 2018.

Table 1 - Personal and clinical characterization of the study participants according to the intervention (IG) and control (CG) groups

	Total	IG (n = 11) %	CG (n = 13) %	p-value
BMI classification				
Overweight	68.2	54.5	81.8	0.361
Normal weight	31.8	45.5	18.2	
Schooling				
Primary education	13.6	9.1	18.2	1.000
Secondary education	59.1	63.6	54.5	
Higher education	27.3	27.3	27.3	
Occupation				
Holding one or more jobs	27.3	18.2	36.4	0.843
Retired	54.5	63.6	45.5	
Unemployed or homemaker	18.2	18.2	18.2	
Marital status				
No partner	59.1	81.8	36.4	0.080
With partner	40.9	18.2	63.6	
Income				
Upper class (A+B)	9.1	18.2	0.0	0.522
Middle class (C)	18.2	18.2	18.2	
Lower class (D+E)	72.7	63.6	81.8	
Previous treatment				
Yes	95.5	90.9	100	1.000
No	4.5	9.1	0.0	
Hormone therapy				
Anastrozole	54.5	45.5	63.6	0.817
Tamoxifen	36.4	45.5	27.3	
Exemestane	9.1	9.1	9.1	
Recurrence				
Yes	4.5	9.1	0.0	1.000
No	95.5	90.9	100	
Lymphedema				
Yes	9.1	18.2	0.0	0.476
No	90.9	81.8	100	
Lymphedema symptom				
Yes	36.4	45.5	27.3	0.659
No	63.6	54.5	72.7	
Mastectomy type				
Total	13.6	9.1	18.2	1.000
Conservative	77.3	81.8	72.7	
Bilateral	9.1	9.1	9.1	
Reconstruction				
Immediate	9.1	9.1	9.1	0.012
Late	27.3	0.0	54.5	
Not performed	63.6	90.9	36.4	
Axilla				
Axillary emptying	40.9	36.4	45.5	0.269
Lymph node biopsy	45.5	36.4	54.5	
Not performed	13.6	27.3	0.0	
Urinary incontinence				
Yes	13.6	9.1	18.2	1.000
No	86.4	90.9	81.8	

Note: Fisher's exact test.

Table 2 - Body image of breast cancer patients in the intervention (IG) and control (CG) groups

Body image	IG (n = 11)				CG (n = 13)				
	Pre	Post	p-value intragroup*	CIS	Pre	Post	p-value intragroup*	CIS	p-value intergroup**
Vulnerability	15.5 ± 8.1	16.6 ± 6.0	0.738 ^a	+1.1	17.7 ± 4.8	17.2 ± 7.3	0.826 ^a	-0.5	0.833 ^c
Body stigma	52.6 ± 8.0	22.7 ± 7.0	< 0.001^a	-29.9	40.5 ± 13.1	39.7 ± 13.8	0.891 ^a	-0.8	0.002^c
Concern with body	24.1 ± 3.3	11.2 ± 3.2	< 0.001^a	-12.9	16.9 ± 5.4	14.7 ± 3.3	0.088 ^a	-2.2	0.017^c
Limitation	13.7 ± 4.5	11.0 ± 4.4	0.153 ^b	-2.7	11.6 ± 4.5	10.9 ± 4.2	0.723 ^b	-0.7	0.815 ^d
Transparency	8.5 ± 5.0	8.0 ± 3.8	0.797 ^b	-0.5	8.3 ± 4.7	8.5 ± 5.6	0.722 ^b	+0.2	0.626 ^d
Concern with arms	6.8 ± 3.5	5.36 ± 2.1	0.303 ^b	-1.4	6.2 ± 3.0	5.3 ± 3.4	0.423 ^b	-0.9	0.669 ^d

Note: Pre = before intervention; post = after intervention; CIS = change in score. *p-value for comparison between the pre- and post-IG and CG periods; **p-value for comparison between IG and CG in the post-intervention period. ^aT-test for paired samples. ^bWilcoxon test. ^cT-test for independent samples. ^dMann-Whitney U test. Significant value (p < 0.05) highlighted in bold. The lower the score, the better the body image was.

Table 3 - Sexual function in breast cancer patients in the intervention (IG) and control (CG) groups

Sexual function scales	IG (n = 11)				CG (n = 13)				
	Pre	Post	p-value intragroup*	CIS	Pre	Post	p-value intragroup*	CIS	p-value intergroup**
Desire	5.0 ± 1.4	4.5 ± 1.6	0.147 ^a	-0.5	4.6 ± 1.1	1.0 ± 1.3	0.089 ^a	+3.6	0.673 ^d
Arousal	1.2 ± 2.0	0.9 ± 1.9	0.752 ^a	-0.3	2.6 ± 1.9	2.5 ± 1.8	0.933 ^a	-0.1	0.346 ^d
Lubrication	1.5 ± 2.2	1.2 ± 2.1	0.683 ^a	-0.3	2.8 ± 2.0	2.9 ± 1.7	0.324 ^a	+0.1	1.000 ^d
Orgasm	1.3 ± 2.0	1.0 ± 1.9	0.674 ^a	-0.3	2.8 ± 1.9	2.6 ± 1.5	0.723 ^a	-0.2	0.325 ^d
Satisfaction	1.6 ± 1.6	2.1 ± 1.4	0.396 ^b	+0.5	2.4 ± 1.2	1.8 ± 1.2	0.144 ^b	-0.6	0.720 ^c
Desconforto	1.6 ± 2.2	1.3 ± 2.4	0.753 ^a	-0.3	3.7 ± 2.4	3.9 ± 2.4	0.623 ^a	+0.2	0.931 ^d
Total score	12.6 ± 9.4	11.3 ± 9.4	0.753 ^a	-1.3	19.3 ± 8.8	18.4 ± 7.3	0.715 ^a	-0.8	0.074 ^d

Note: Pre = before intervention; post = after intervention; CIS = change in score. *p-value for comparison between the pre- and post-IG and CG periods; **p-value for comparison between IG and CG in the post-intervention period. ^aT-test for paired samples. ^bWilcoxon test. ^cT-test for independent samples. ^dMann-Whitney U test. The lower the score, the worse the sexual function.

Discussion

The main study objective was to analyze the effect of the practice of belly dancing on the sexual function and body image of breast cancer patients undergoing adjuvant hormone therapy, cared for at CEPON in Florianópolis, SC. The study did not show significant intra- and intergroup differences in sexual function; on the other hand, there was a significant intergroup result in body image in the domains body stigma and body concerns, with both domains showing better body image for IG.

Patients submitted to the belly dancing intervention for 16 weeks showed no effect on the final score of

sexual function, as well as on any of its scales. It is noted that the sample in general had values lower than 26 points in the final scale of sexual function, which means a higher risk for sexual dysfunction. These findings may be related to the negative effect of treatment for breast cancer.^{7,39} Hormone therapy reduces sexual function, which may be an inhibiting factor of sexual function.⁴⁰ The discomfort domain of the women who participated in the intervention showed a low mean, indicating no significant improvement, and this domain is the symptom that most influences sexual function,¹³ which may explain the lack of improvement in this variable. In

addition, 60% of the women in this study were without a partner. Moreover, the mean age of the study was 60 ± 10.4 years, and some studies indicate that starting at this age, there is impaired sexual function,^{10,40,41} lack of opportunity for sex because of the absence of a sexual partner,⁴² and decreased libido,⁴⁰ because of reduced estrogen and progesterone production.⁴³

We highlight the findings regarding the significant intergroup difference in the domains of body stigma and body concerns, with better body image for women randomized to IG. Body image is considered as the way one evaluates one's own body and how it is represented in the mind.³⁸ Belly dancing comes to the aid of this concern through its aesthetics and pattern of movements,⁴⁴ with continuous, large and sensual elements. Moreover, this practice improves body posture and body awareness, physical conditioning and functional performance.⁴⁴ Thus, belly dancing is a therapeutic practice that helps one regain the significance of one's body, as well as self-awareness and self-acceptance.

Another study pointed out that women over the age of 50 who practiced belly dancing reported that dancing is a way of uniting body, mind and rhythm, and a form of collective joy.²⁷ The same study pointed out that the creation of friendships is facilitated with the practice, in which space becomes a place where women feel free to explore their creativity and body movement without fear of judgments, where the goal is to flow together as a unit, without competition and comparison.

Furthermore, the intervention and the practice of physical exercises, such as belly dancing, by women with breast cancer is very beneficial and documented in the literature; in other aspects, exercise stimulates high levels of quality of life,²⁰ increased muscle strength,^{19,45} improved mood, maintenance of energy, improvement in emotional spheres, better sleep,¹⁹ and less fatigue symptoms,^{20,45} anxiety and depression.¹⁸ On the other hand, lack of exercise aggravates the side effects of breast cancer disease and treatment, as it increases the feeling of fatigue and intensifies physical wear and tear, in addition to the loss of muscle strength.⁵ Therefore, physical exercise should be encouraged for the prevention, treatment and post-treatment of breast cancer.⁴⁶

Some limitations of the present study can be overcome, such as seeking more alternatives for the adherence of women to the program, such as closer and more easily accessible intervention sites, to reduce

travel time, and special classes provided on the calendar. Another suggestion is the implementation of external characteristic elements of belly dancing, such as costumes and makeup. In addition, obtaining a larger sample size and a longer intervention time to intensify the practice and its benefits, even at the risk of sample loss.

Conclusion

Women who underwent belly dancing intervention showed significant changes in body stigma scores and body concerns in relation to body image. Thus, physical exercise is important in helping breast cancer patients return to their daily lives, and it improves factors that influence quality of life, with dancing being a practice that helps throughout the process. Therefore, further studies are warranted to examine the effect of physical activity and dancing on other aspects of these women's lives.

Considering the findings of this randomized clinical trial, multidisciplinary programs would be interesting and should be encouraged in breast cancer rehabilitation to improve the psychological and physical well-being of these women.

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Authors' contributions

LAD and LB worked on the study design, research, methodology, data collection and final writing. TBF worked on study concept, research, methodology and data collection. ACAG worked on the study concept, methodology and, together with the author FFS, the final writing of the work.

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