Sexual function in premenopausal women with breast cancer

Filipa Pontes (✉ filipapontes87@gmail.com)
Instituto Português de Oncologia de Coimbra Francisco Gentil EPE: Instituto Portugues de Oncologia de Coimbra Francisco Gentil EPE  https://orcid.org/0000-0002-2187-0545

Joana Magalhaes
Instituto Português de Oncologia de Coimbra Francisco Gentil EPE: Instituto Portugues de Oncologia de Coimbra Francisco Gentil EPE

Raquel Basto
Instituto Português de Oncologia de Coimbra Francisco Gentil EPE: Instituto Portugues de Oncologia de Coimbra Francisco Gentil EPE

Rita Felix
Instituto Português de Oncologia de Coimbra Francisco Gentil EPE: Instituto Portugues de Oncologia de Coimbra Francisco Gentil EPE

Monica Mariano
Instituto Português de Oncologia de Coimbra Francisco Gentil EPE: Instituto Portugues de Oncologia de Coimbra Francisco Gentil EPE

Gabriela Sousa
Instituto Português de Oncologia de Coimbra Francisco Gentil EPE: Instituto Portugues de Oncologia de Coimbra Francisco Gentil EPE

Original Article

Keywords: Breast Cancer, Sexual Dysfunction, Premenopausal

DOI: https://doi.org/10.21203/rs.3.rs-161552/v1

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Abstract

Background: This cross-sectional study assessed Female Sexual Function Index (FSFI) scores in premenopausal women with breast cancer diagnosis. We aimed to determine variables that are associated with sexual dysfunction and if these thematic is being addressed by healthcare professionals.

Methods: The FSFI questionnaire was administered to 199 premenopausal women 6 months after completing breast cancer initial treatment (surgery, radiation therapy or chemotherapy). A demographic questionnaire was administered. Scores were compared between sexually active women sub-groups. Questions, regarding FSFI acceptability and to find out if healthcare professionals are addressing these thematic were included.

Results: The study included 199 women. Thirty-three were excluded from analysis because they declared no sexual activity in the 4 weeks before the survey. Ninety-seven women met the FSFI cutoff score for a sexual dysfunction. FSFI Scores were significantly lower in women treated with radiation therapy and in women treated with radical mastectomy and lumpectomy when compared with mastectomy with immediate reconstruction. One hundred and thirty-eight women were never or rarely questioned about their sexual health even though 71.2% reported feeling comfortable about sharing this problematic with doctors. Both sexually active and non-active women provided positive feedback about the FSFI.

Conclusion: FSFI scores were compatible with sexual dysfunction in more than half of the sexually active women. Women treated with radiation therapy, radical mastectomy and lumpectomy had significant lower FSFI scores. With desirable acceptability, the FSFI is suitable for screening for sexual dysfunction in premenopausal women with

Introduction

Breast cancer is the most common female cancer [1]. Earlier detection screening and novel treatment approaches have contributed to high survival rates leading to increased consideration of the quality of life issues in these breast cancer women survivors [2]. As the number of breast cancer survivors increases, there is increased consideration of women's sexual functioning [3]. Female sexual dysfunction, which includes abnormalities in sexual desire, arousal, lubrication, satisfaction, orgasm, and dyspareunia, is one of the most common complications in women with breast cancer [4].

In 2000, Rosen et al. [4] published the female sexual function index (FSFI), a 19-item instrument that has been validated as a tool to measure sexual function among women with cancer, and it has been recognized as the most frequently used tool to measure sexual function in this population [5]. It assesses six domains of sexuality, including desire, arousal, lubrication, orgasm, satisfaction, and pain. Sexual dysfunction has been identified as an FSFI score < 26.55, with higher scores indicating higher levels of sexual function [4]. Although the FSFI is broadly used in breast cancer research [5], few studies have examined sexual problems exclusively in premenopausal women, resulting in a lack of knowledge regarding sexual function and reproductive concerns in these women [6]. However, a diagnosis of breast cancer is more traumatic for young women than for older women because of more severe psychosocial concerns due to the adverse
reproductive effects of treatment [7]. To refine the understanding of the impact of cancer therapies on this setting's sexuality, prospective data on the prevalence of Sexual Dysfunction is needed. The overall aim of the current study was to investigate the prevalence of sexual dysfunction in premenopausal women with breast cancer diagnosis and to assess the appropriateness of the FSFI when administered to these breast cancer patients. We also would like to determine the variables that are associated with sexual dysfunction. It was our concern to find out if these thematic is being addressed by healthcare professionals and if young women with sexual dysfunction diagnosis feel the need of being referenced to a specific appointment on sexual dysfunction.

Material And Methods

STUDY DESIGN AND PARTICIPANTS

Following approval to conduct this research from the Instituto Português de Oncologia Francisco Gentil - Coimbra Ethics Committee, participants were recruited from the medical oncology appointment. A convenience sample of female breast cancer survivors who had no evidence of recurrent disease was collected. Patients were included if they had completed surgery, radiation therapy and chemotherapy at least six months previous to the study. If the patients had completed their initial therapy but were continuing adjuvant hormonal therapy (i.e., tamoxifen), anti-HER2 therapy (i.e., trastuzumab), or LHRH agonists (i.e., goserelin), they also were recruited for the study. Patients, irrespective of sexual functioning status, were recruited at well-patient follow-up appointments between October 2019 and July 2020. Recruited breast cancer survivors were asked to complete the study questionnaire after the informed consent was signed. The study questionnaire included:

- The Female Sexual Function Index (FSFI) questionnaire was administered to premenopausal patients during medical appointments. This instrument consists of 19 questions on the sexual activity performed in the last four weeks. It enables the assessment of six sexual functioning domains: desire, arousal, lubrication, orgasm, satisfaction, and discomfort/pain [9]. Sub-domains are scored considering the values of each question and its respective conversion factors, and the total FSFI Score is the sum of the six results, ranging from 2 to 36, and better levels of sexual function are indicated by the highest scores.
- A demographic questionnaire on family, social, and educational history was also administered concomitant with FSFI to all patients to collect data on patient age, academic achievement, marital status, employment status, and the number of children.
- We included two questions to find out if healthcare professionals are addressing these thematic and if patients felt comfortable about sharing sexual problems in the appointments, rated on a 5-Point scale (Always; Very Frequently; Occasionally; Rarely; Never )
- To evaluate the user acceptability, we included four questions used in prior FSFI research [10] (e.g., 'I felt comfortable answering the questions') rated on a 5-Point Likert-Type scale ranging from 'strongly disagree' to 'strongly agree.' A mean score over three is considered as positive feedback.
• Patients were also asked about their wish to be referenced to a Sexual Oncology appointment in case of sexual dysfunction diagnosis.

Medical history, tumor data, and treatment course were collected by retrospective chart review. Tumor data included tumor pathology, stage, laterality, and receptor status. The treatment course included surgery type, the timing of surgery, chemotherapy and endocrine therapy type, and reconstruction data.

**Statistical Analyses**

Continuous variables were expressed as mean ± standard deviation (in case of symmetric distribution) or median and interquartile range (for asymmetric distributions). Categorical variables were expressed as absolute and relative frequencies. Student's t-test or the one way ANOVA was used for between-group comparisons. Statistical significance was set to \( a = 0.05 \). All analyses were conducted using the SPSS (Version 22, Armonk, NY: IBM Corp).

**Results**
Table 1
Demographic characteristics (n = 200)

| Characteristics          | Mean ± standard deviation |
|--------------------------|---------------------------|
| Age at diagnosis         | 39.66 ± 5.76              |
| Age at study participation| 42.52 ± 5.62              |

| Age sub-group | n   | %  |
|---------------|-----|----|
| 20–30         | 13  | 6.5|
| 31–35         | 46  | 23.1|
| 36–40         | 62  | 31.2|
| 41–45         | 73  | 36.7|
| >45           |     |    |

| Marital Status | n    | %  |
|----------------|------|----|
| Married        | 28   | 14.1|
| Single         | 24   | 12.1|
| Divorced       | 2    | 1   |
| Widow          | 1    | 0.5 |
| Missing data   |      |    |

| Children | n   | %  |
|----------|-----|----|
| Yes      | 37  | 18.6|
| No       |     |    |

| Number of children | n   | %  |
|--------------------|-----|----|
| 0                  | 75  | 37.7|
| 1                  | 79  | 39.7|
| 2                  | 7   | 3.5 |
| 3                  | 1   | 0.5 |
| 4                  |     |    |
| Characteristics         |   |   |
|-------------------------|---|---|
| **Education level**     |   |   |
| Low (no education, primary education) | 54 | 27.1 |
| Secondary school (high school) | 75 | 37.7 |
| Higher (college, university) | 70 | 35.2 |
| **Employment status**   |   |   |
| Employed                | 133 | 66.8 |
| Unemployed (and/or housewife) | 30 | 15.1 |
| Declared medically unfit | 29 | 14.6 |
| Retired                 | 7 | 3.5 |
| **Histological subtype**|   |   |
| Luminal A               | 59 | 29.6 |
| Luminal B               | 93 | 46.7 |
| Luminal B HER2+         | 27 | 13.6 |
| Triple-Negative         | 14 | 7 |
| HER2+                   | 6 | 3 |
| **Clinical Stage**      |   |   |
| I                       | 108 | 54.3 |
| II                      | 65 | 32.7 |
| III                     | 22 | 11.1 |
| Missing data            | 4 | 2 |
| **Neo-adjuvant therapies** |   |   |
| Chemotherapy            | 84 | 42.2 |
| Anti-Her2               | 23 | 11.6 |
| **Adjuvant therapies**  |   |   |
| Chemotherapy            | 48 | 24.1 |
| Anti-Her2               | 27 | 13.6 |
| Radiotherapy            | 110 | 55.3 |
| Endocrine-Therapy       | 178 | 89.4 |
| LHRH agonists           | 142 | 71.4 |
The study included an initial cohort of 199 breast cancer patients with at least six months of follow-up evaluation after completion of adjuvant treatment, with no evidence of active or recurrent disease and free of any oncologic treatment. Thirty-three patients declared no sexual activity in the four weeks before the survey (16.6%). These patients were excluded from further analysis.

The mean age at study participation was $42.52 \pm 5.62$ years (range 22–58 years), and the mean age at breast cancer diagnosis was $39.66 \pm 5.76$ years (range 22–57 years). The sample was predominately well-educated, married, white, female breast cancer survivors (Table 1). The majority ($n = 108$) were in the American Joint Committee Cancer 8th edition Stage I.

Means, standard deviation statistics are presented in Table 2. The two FSFI dimensions that were rated the lowest in terms of the level of functioning were Desire ($M = 3.18$, $SD = 1.12$) and Arousal ($M = 3.69$, $SD = 1.37$). Ninety-seven women (58.4%) met the FSFI clinical cutoff score for sexual dysfunction.

The final FSFI score was compared, resorting to an independent sample t-test or the ANOVA for the variables Age group, Children, Education level, Employment status, Clinical Stage, Surgery type, Neo-adjuvant and adjuvant treatments, and Radiotherapy. No statistically significant differences were observed between age sub-groups ($p = 0.965$), women that had children when compared to those who didn't ($p = 0.826$), education level sub-groups ($p = 0.474$), employment status sub-groups ($p = 0.416$), clinical-stage subgroups ($p = 0.641$), and women that underwent through neoadjuvant or adjuvant systemic therapy when compared to those who didn't do any systemic therapy ($p = 0.419$).
Table 3
– FSFI score – sub-group analysis (Means, standard deviations statistics)

| Group            | Sub-group   | Mean    | Std. Deviation | p-value |
|------------------|-------------|---------|----------------|---------|
| Age group        | 20–30       | 21,9800 | 11,03594       | 0.965   |
|                  | 31–35       | 24,2333 | 7,82494        |         |
|                  | 36–40       | 23,7410 | 6,04282        |         |
|                  | 41–45       | 24,0566 | 5,94887        |         |
|                  | > 45        | 24,1632 | 6,76099        |         |
| Children         | no          | 24,2067 | 7,47630        | 0.845   |
|                  | yes         | 23,9169 | 6,29551        |         |
| Education level  | Low         | 23,0646 | 6,88531        | 0.474   |
|                  | Secondary   | 24,0839 | 6,67322        |         |
|                  | Higher      | 24,6179 | 5,97766        |         |
| Employment status| Employed    | 24,1422 | 6,50476        | 0.416   |
|                  | Declared medically unfit | 24,3545 | 6,94535       |         |
|                  | Unemployed  | 22,2375 | 6,22085        |         |
|                  | Retired     | 27,2250 | 5,27534        |         |
| Clinical stage   | I           | 24,1088 | 6,40013        | 0.641   |
|                  | II          | 23,3107 | 6,95912        |         |
|                  | III         | 24,8800 | 5,31631        |         |
| Chemotherapy     | no          | 24,5328 | 6,61063        | 0.419   |
|                  | yes         | 23,6667 | 6,45205        |         |
| Radiotherapy     | no          | 25,1697 | 5,80726        | 0.028   |
|                  | yes         | 22,9556 | 6,90400        |         |
| Endocrine Therapy| no          | 24,2393 | 6,77202        | 0.810   |
|                  | yes         | 23,9145 | 6,46882        |         |
| Type of surgery  | TMRM        | 23,2677 | 6,25255        | 0.004   |
|                  | MIBR        | 27,3030 | 4,85344        |         |
|                  | LWLE        | 22,8162 | 7,53247        |         |
A statistically significant difference was found between the FSFI scores in patients that underwent through Radiotherapy when compared to those who did not \((p = 0.026)\).

|          | Radiotherapy | N   | Mean   | Std. Deviation | p-value |
|----------|--------------|-----|--------|----------------|---------|
| **Desire** | no           | 76  | 3.3868 | 1.08091        | 0.03    |
|          | yes          | 90  | 3.0067 | 1.14654        |         |
| **Arousal** | no          | 76  | 3.8566 | 1.25638        | 0.117   |
|          | yes          | 90  | 3.5500 | 1.24488        |         |
| **Lubrication** | no         | 76  | 4.3263 | 1.31660        | 0.071   |
|          | yes          | 90  | 3.9433 | 1.39888        |         |
| **Orgasm**  | no           | 76  | 4.3105 | 1.33162        | 0.175   |
|          | yes          | 90  | 4.0089 | 1.52401        |         |
| **Satisfaction** | no          | 76  | 4.8474 | 1.02651        | 0.127   |
|          | yes          | 90  | 4.5600 | 1.38148        |         |
| **Pain**    | no           | 76  | 4.4421 | 1.34910        | 0.016   |
|          | yes          | 90  | 3.8867 | 1.60226        |         |
| **Score**   | no           | 76  | 25.1697| 5.80726        | 0.026   |
|          | yes          | 90  | 22.9556| 6.90400        |         |

Post hoc tests with Bonferroni correction were used to assess differences between each surgery type sub-group. Statistically significant differences were found for FSFI score \((p = 0.004)\) and the Arousal \((p = 0.01)\), Lubrification \((p = 0.01)\), Orgasm \((p = 0.005)\) and Satisfaction domains. For the FSFI score, the post hoc tests reveal the existence of statistically significant differences between mastectomy with immediate reconstruction sub-group and Lumpectomy / wide local excision subgroup \((p = 0.01)\) as well as between mastectomy with reconstruction sub-group and Single/double mastectomy sub-group \((0.006)\). No statistically significant differences were observed between Lumpectomy / wide local excision subgroup and total/modified radical mastectomy sub-group \((p = 1.000)\).
|                      | N  | Mean   | Std. Deviation | 95% Confidence Interval for Mean | Minimum | Maximum |
|----------------------|----|--------|----------------|---------------------------------|---------|---------|
|                      |    |        |                | Lower Bound                      |         |         |
|                      |    |        |                | Upper Bound                      |         |         |
| **Desire**           |    |        |                |                                 |         |         |
| TMRM                 | 96 | 3,1125 | 1,13613        | 2,8823                          | 1,20    | 5,40    |
| MIBR                 | 33 | 3,5273 | 1,18830        | 3,1059                          | 1,20    | 6,00    |
| LWLE                 | 37 | 3,0486 | 1,02351        | 2,7074                          | 1,20    | 4,80    |
| Total                | 166| 3,1807 | 1,12970        | 3,0076                          | 1,20    | 6,00    |
| **Arousal**          |    |        |                |                                 |         |         |
| TMRM                 | 96 | 3,5656 | 1,26373        | 3,3096                          | 0,0     | 6,00    |
| MIBR                 | 33 | 4,2727 | 1,08434        | 3,8882                          | 1,20    | 6,00    |
| LWLE                 | 37 | 3,4946 | 1,25542        | 3,0760                          | 1,20    | 5,70    |
| Total                | 166| 3,6904 | 1,25574        | 3,4979                          | 0,0     | 6,00    |
| **Lubrication**      |    |        |                |                                 |         |         |
| TMRM                 | 96 | 4,0375 | 1,30071        | 3,7740                          | 0,0     | 6,00    |
| MIBR                 | 33 | 4,7273 | 1,12508        | 4,3283                          | 2,10    | 6,00    |
| LWLE                 | 37 | 3,7865 | 1,59899        | 3,2534                          | 0,90    | 6,00    |
| Total                | 166| 4,1187 | 1,37116        | 3,9085                          | 0,0     | 6,00    |
| **Orgasm**           |    |        |                |                                 |         |         |
| TMRM                 | 96 | 4,0083 | 1,45672        | 3,7132                          | 0,0     | 6,00    |
| MIBR                 | 33 | 4,8606 | 0,93339        | 4,5296                          | 2,40    | 6,00    |
| LWLE                 | 37 | 3,8703 | 1,60293        | 3,3358                          | 1,20    | 6,00    |
| Total                | 166| 4,1470 | 1,44275        | 3,9259                          | 0,0     | 6,00    |
| **Satisfaction**     |    |        |                |                                 |         |         |
| TMRM                 | 96 | 4,5125 | 1,28696        | 4,2517                          | 0,80    | 6,00    |
| MIBR                 | 33 | 5,2606 | 0,59263        | 5,0505                          | 3,60    | 6,00    |
| LWLE                 | 37 | 4,6486 | 1,39316        | 4,1841                          | 0,80    | 6,00    |
| Total                | 166| 4,6916 | 1,23654        | 4,5021                          | 0,80    | 6,00    |
| **Pain**             |    |        |                |                                 |         |         |
| TMRM                 | 96 | 4,0313 | 1,53755        | 3,7197                          | 0,0     | 6,00    |
| MIBR                 | 33 | 4,6545 | 1,17396        | 4,2383                          | 2,00    | 6,00    |
| LWLE                 | 37 | 3,9676 | 1,65026        | 3,4173                          | 0,0     | 6,00    |

* The mean difference is significant at the 0.05 level.

** TMRM (total/modified radical mastectomy); MIBR (mastectomy with immediate breast reconstruction); LWLE (lumpectomy / wide local excision)
| Score | Total  | 166 | 4,1410 | 1,51298 | 3,9091 | 4,3728 | .00 | 6,00 |
|-------|--------|-----|--------|---------|--------|--------|-----|------|
| TMRM  | 96     | 23,2677 | 6,25255 | 22,0008 | 24,5346 | 9,30 | 34,50 |
| MIBR  | 33     | 27,3030 | 4,85344 | 25,5821 | 29,0240 | 13,70 | 35,30 |
| LWLE  | 37     | 22,8162 | 7,53247 | 20,3048 | 25,3277 | 9,20 | 33,20 |
| Total  | 166    | 23,9693 | 6,50106 | 22,9730 | 24,9655 | 9,20 | 35,30 |

* The mean difference is significant at the 0.05 level.

** TMRM (total/modified radical mastectomy); MIBR (mastectomy with immediate breast reconstruction; LWLE (lumpectomy / wide local excision)
Table 6
– FSFI score – One way Anova surgery type multiple Comparisons

| Dependent Variable | Surgery Type | Surgery Type | Mean Difference | Std. Error | Sig. | 95% Confidence Interval |
|--------------------|--------------|--------------|-----------------|------------|------|------------------------|
|                    | TMRM         | MIBR         | -0.41477        | 0.22659    | 0.207| -0.9629 , 0.1333      |
|                    | LWLE         | MIBR         | 0.06385         | 0.21728    | 1.000| -0.4617 , 0.5894      |
|                    | MIBR         | TMRM         | 0.41477         | 0.22659    | 0.207| -0.1333 , 0.9629      |
|                    | LWLE         | TMRM         | 0.47862         | 0.26886    | 0.231| -1.1717 , 1.1290      |
|                    | LWLE         | MIBR         | -0.06385        | 0.21728    | 1.000| -0.5894 , 0.4617      |
|                    | MIBR         | LWLE         | -0.47862        | 0.26886    | 0.231| -1.1290 , 0.1717      |
| Desire             | TMRM         | MIBR         | -0.70710*       | 0.24794    | 0.015| -1.3069 , -0.1073     |
|                    | LWLE         | MIBR         | 0.07103         | 0.23776    | 1.000| -0.5041 , 0.6462      |
|                    | MIBR         | TMRM         | 0.70710*        | 0.24794    | 0.015| 0.1073 , 1.3069       |
|                    | LWLE         | TMRM         | 0.77813*        | 0.29420    | 0.027| 0.0665 , 1.4898       |
|                    | LWLE         | MIBR         | -0.07103        | 0.23776    | 1.000| -0.6462 , 0.5041      |
|                    | MIBR         | LWLE         | -0.77813*       | 0.29420    | 0.027| -1.4898 , -0.0665     |
| Arousal            | TMRM         | MIBR         | -0.68977*       | 0.27067    | 0.035| -1.3445 , -0.0350     |
|                    | LWLE         | MIBR         | 0.25101         | 0.25956    | 1.000| -0.3768 , 0.8789      |
|                    | MIBR         | TMRM         | 0.68977*        | 0.27067    | 0.035| 0.0350 , 1.3445       |
|                    | LWLE         | TMRM         | 0.94079*        | 0.32117    | 0.012| 0.1639 , 1.7177       |
|                    | LWLE         | MIBR         | -0.25101        | 0.25956    | 1.000| -0.8789 , 0.3768      |
|                    | MIBR         | LWLE         | -0.94079*       | 0.32117    | 0.012| -1.7177 , -1.639      |
| Lubrication        | TMRM         | MIBR         | -0.85227*       | 0.28361    | 0.009| -1.5383 , -1.1662     |
|                    | LWLE         | MIBR         | 0.13806         | 0.27196    | 1.000| -0.5198 , 0.7959      |
|                    | MIBR         | TMRM         | 0.85227*        | 0.28361    | 0.009| 0.1662 , 1.5383       |
|                    | LWLE         | MIBR         | 0.99034*        | 0.33652    | 0.011| 0.1763 , 1.8043       |
|                    | LWLE         | TMRM         | -0.13806        | 0.27196    | 1.000| -0.7959 , 0.5198      |
## Bonferroni

|       | MIBR       | TMRM    | LWLE  | MIBR       | TMRM    | LWLE  | MIBR       | TMRM    | LWLE  |
|-------|------------|---------|-------|------------|---------|-------|------------|---------|-------|
|       |            | -0.99034* | 0.33652 | 0.011 | -1.8043 | -0.1763 |
| Satisfaction | MIBR       | -0.74811* | 0.24407 | 0.008 | -1.3385 | -0.1577 |
|         | LWLE       | -0.13615 | 0.23405 | 1.000 | -0.7023 | 0.4300  |
|         | MIBR       | 0.74811*  | -0.24407| 0.008 | 1.5777  | 1.3385  |
|         | LWLE       | 0.61196  | -0.28960| 0.108 | -0.0886 | 1.3125  |
|         | LWLE       | 0.13615  | 0.23405 | 1.000 | -0.4300 | 0.7023  |
|         | MIBR       | -0.61196 | -0.28960| 0.108 | -1.3125 | 0.0886  |
| Pain   | MIBR       | -0.62330 | 0.30268 | 0.123 | -1.3555 | 1.089   |
|         | LWLE       | 0.06368  | 0.29025 | 1.000 | -0.6384 | 0.7658  |
|         | MIBR       | 0.62330  | 0.30268 | 0.123 | -1.089  | 1.3555  |
|         | LWLE       | 0.68698  | 0.35915 | 0.173 | -1.818  | 1.5557  |
|         | LWLE       | 0.06368  | 0.29025 | 1.000 | -0.7658 | 0.6384  |
|         | MIBR       | 0.68698  | 0.35915 | 0.173 | -1.5557 | 1.818   |
| Score  | MIBR       | 4.03532* | 1.27529 | 0.006 | -7.1202 | -0.9505 |
|         | LWLE       | 0.45149  | 1.22292 | 1.000 | -2.5067 | 3.4097  |
|         | MIBR       | 4.03532* | 1.27529 | 0.006 | 0.9505  | 0.7502  |
|         | LWLE       | 4.48681* | 1.51321 | 0.010 | 0.8265  | 8.1472  |
|         | LWLE       | -0.45149 | 1.22292 | 1.000 | -3.4097 | 2.5067  |
|         | MIBR       | -4.48681*| 1.51321 | 0.010 | -8.1472 | -0.8265 |

* The mean difference is significant at the 0.05 level.

** TMRM (total/modified radical mastectomy); MIBR (mastectomy with immediate breast reconstruction; LWLE (lumpectomy / wide local excision)

## Acceptability to patients

Overall, the women provided positive feedback about the FSFI, as they reported feeling comfortable answering questions (M = 4.38, SD = 0.91), that the questions were easy to complete (M = 4.50, SD = 0.85) relevant to their experiences (M = 4.30, SD = 0.89); and the questionnaire was about the right length (M = 4.38, SD = 0.68).

## Sexual health assessment
One hundred and thirty-eight women (69.3%) were never or rarely questioned about their sexual health during their medical oncology appointment even though 151 women (71.2%) reported feeling comfortable about sharing this thematic with their doctors.

Out of the 97 women that met the FSFI criteria for sexual dysfunction, 60 (61.9%) of the women with sexual functioning problems felt a need for a specific medical appointment related to sexual dysfunction.

**Discussion**

This study assessed sexual function in premenopausal women with breast cancer diagnosis treated at a large, public cancer center in a south European country. FSFI scores met the clinical cutoff score for sexual dysfunction in more than half (58.4%) of the 166 sexually active women in the study. This high prevalence of sexual dysfunction may be due to their Breast Cancer-specific treatment experiences, such as body image changes after breast surgery, hormone treatments, and the physiological and psychological effects of chemoradiotherapy. [11] Given these findings, it is important that greater attention be paid to the sexual function changes affecting women with breast cancer. These results may thereby help to increase the availability of assistance for women with BC who are facing sexual health problems.

Subgroup analysis showed that regarding FSFI score in women with Breast Cancer, there were statistically significant differences between women that did radiotherapy when compared to those who did not. Breast irradiation usually is given daily for about 3 to 6.5 weeks. It is associated with short term side effects (first three months after treatment) of fatigue and skin erythema, and long term side effects (3 months to 3 years after treatment) of breast edema, pain, fibrosis, and telangiectasia. Studies of patients treated with mastectomy have suggested that the addition of postoperative radiotherapy was associated with a higher incidence of psychological morbidities, such as depression and anxiety. [12–13] Breast-conserving therapy (lumpectomy plus breast irradiation) also have been suggested, when compared with mastectomy or lumpectomy alone, to be associated with an increase in affective symptoms. [14–15] Other studies have not shown any effect of postoperative radiation therapy on psychological distress but have suggested significant effects on physical symptoms, in particular, fatigue. [14–15]

Our results demonstrate a lower FSFI score in patients treated with radical mastectomy and lumpectomy when compared to mastectomy with immediate reconstruction. Women who undergo mastectomy with immediate reconstruction have the greatest opportunity for preservation of their native skin envelope, and theoretically, a natural cosmetic outcome. Given body image dissatisfaction has been linked to a more prevalence of sexual dysfunction, this fact might explain the outcomes for mastectomy patients [26–28]. Otherwise, radiotherapy was offered to all patients that had lumpectomy as breast surgery, conditions that could contribute to a higher prevalence of sexual dysfunction in this group of patients.

This study also investigated women's care needs and their experience with health professionals regarding the inclusion of problems with sexual functioning as part of treatment. The results showed that out of the 97 women that met the FSFI criteria for sexual dysfunction, 60 (61.9%) of the women with sexual functioning problems felt a need for a specific medical appointment related to sexual dysfunction. One hundred and thirty-eight women (69.3%) were never or rarely questioned about their sexual health during
their medical oncology appointment. This means that these women were deprived of care. Discussing sexual issues is difficult for both patients and for health care providers, and sexual concerns often remain unaddressed during treatment [18–21]. Although there is a tendency to consider sexual issues as taboo, our study found that cancer patients’ opinions are different. Patients expressed a great desire to discuss and disclose information concerning their sexual life, as shown by the high percentage of study participants (71.2%). Based on the findings from this study, health care professionals should be encouraged to inquire about their patients’ sexual concerns.

The participants in this study reported feeling comfortable answering the questionnaire, that the questions were easy to complete, relevant to their experiences, and the questionnaire was about the right length. These findings demonstrate that the FSFI has favorable psychometric properties and is acceptable for use by premenopausal women with breast cancer. The FSFI is, therefore, eminently suited for routine administration to screen for sexual dysfunction in clinical and research settings. The measure is simple to administer and score and is suitable for use by health professionals as a screening tool. As the FSFI is a self-report scale, it will take no additional practitioner time to administer, which is important for busy clinical practices.

This study has some strengths, including the prospective design, the use of a validated measure of sexual function, and the sample size. However, the present study suffers from certain limitations. Firstly, the subgroup sizes make comparisons among treatment groups difficult. Secondly, our analysis did not include medical comorbidities, which in turn might have affected sexual function. The third limitation concerns the use of FSFI, which, albeit criticized as not being the most suitable instrument for sexually inactive participants, has thus far been the better validated instrument for assessing sexual function available in Portugal.

**Conclusion**

Future studies may seek a therapeutic approach capable of minimizing the negative effects of these events on sexual quality of life and on patients' intimate partners.

It is imperative to provide a comprehensive review of the consequences of breast cancer treatments during medical appointments and educational tools to help clinicians describe realistic expectations for both aesthetic and functional outcomes.

Furthermore, health care providers are not properly trained to understand the patient's complaints or to obtain an adequate sexual history [22]. This is the key factor behind current difficulties in assessing the sexual quality of life in cancer patients.

The findings of the present study support the use of the FSFI questionnaire in women with breast cancer patients. Clinicians and researchers will be able to assess any perceived changes in functioning after cancer diagnosis and treatment as well as levels of distress experienced due to sexual difficulties. The latter is important in diagnosing sexual dysfunction and identifying women who would benefit from additional
treatment. Most importantly, the FSFI can be used to give women and professionals the permission to raise the subject of sexual functioning in clinical consultations.

Declarations

CONFLICT OF INTEREST

The authors have no financial relationships related to this manuscript to disclose.

*Declarations
Funding: No funding

Conflicts of interest/Competing interests: The authors have no financial relationships related to this manuscript to disclose.

Ethics approval: This study was proved by the Ethic Committee of Instituto Português de Oncologia Francisco Gentil de Coimbra

Consent to participate: NA

Consent for publication: NA

Availability of data and material: NA

Code availability: NA

Authors' contributions: All authors have contributed with data collection, data analysis and original article writing.

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