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Childbearing across borders: Fertility and parenthood attitudes and decisions among breast cancer survivors in USA and Portugal

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Abstract

Objective—To compare fertility and childbearing attitudes and decisions of Portuguese and American female reproductive aged breast cancer survivors.

Methods—This was a cross-sectional study of 102 young breast cancer survivors (59 from Portugal and 43 from USA). Demographic, clinical and reproductive information were collected. Fertility and parenthood attitudes and decisions were assessed through a self-report questionnaire devised specifically for the study.

Results—Fertility issues became very important after the diagnosis for most of the women (51%). Few differences existed between USA and Portuguese participants. USA participants were more likely to undergo FP (23% USA vs Portugal 5%, p=0.01). Portuguese women were more dissatisfied with their physician's explanations about fertility (Portugal: 23% vs USA: 3%; p = 0.01). Overall, women relied on their oncologist for fertility information (70%); only Portuguese

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Ethical approval

Ethical approval was obtained from the Institutional Review Boards at Moffitt Cancer Center (Chesapeake IRB) and the Ethics Committees and Direction Boards in Portugal.

Conflict of interest statement

There are no commercial or financial interests to declare from the authors of this study.

women discussed fertility with their family medicine physician (11%). Overall, women showed positive attitudes towards motherhood. Portuguese women were more likely to report their partners placed more value on the family after their illness (Portuguese agree: 55% vs USA agree: 14%; p< 0.001).

Conclusions—Fertility and childbearing after breast cancer are important issues regardless of culture, background or country's heath care system. Overall, few differences across the USA and Portuguese samples were found on fertility and childbearing attitudes and decisions.

Keywords

Fertility; childbearing; attitudes; breast cancer; reproductive age; survivors

INTRODUCTION

Breast cancer is the most common malignancy in reproductive aged women [1]. Aggressive treatment regimens [2, 3] are often recommended, which have the potential to impair fertility permanently or temporarily [4]. At diagnosis, many women have not yet started or completed their families [5] and still hope to have children in the future. Therefore, issues regarding fertility and pregnancy are paramount for women's quality of life (QOL) [6, 7]. Advances in assisted reproductive technologies (ART) brought new hope for women who want to preserve their fertility. The decision to pursue fertility preservation (FP) is often complex for both patients and clinicians. Considering women's fertility needs and promoting, a shared decision-making process may result in improvements in women's psychological outcomes [5]

Although fertility issues in breast cancer have attracted recent attention, there is still a paucity of data on women’s attitudes and decisions about childbearing after treatment [8]. Further understanding of those attitudes and decisions is imperative to health communication. There is need to acknowledge the impact reproductive concerns may have on women's life and decision-making. Although, some suggest these issues are secondary in light of a life-threatening illness, research suggests fertility discussions are important for adjustment [9, 10]. Current advances in ART offer survivors new options for FP. Understanding women’s attitudes is essential to devise better decision making/educational tools, improve patient-provider communication, and provide support [8]. There is also need to overcome methodological limitations of previous research. Further, there is a paucity of data on culturally and linguistically diverse samples [5] and a need to examine attitudes across differing cultural values related to childbearing and varying degrees of access to fertility counseling in the context of cancer and FP techniques.

This study compared fertility and childbearing attitudes and decisions of young survivors in Portugal and USA. We examined the influence of demographic, reproductive and clinical variables on their fertility attitudes. The relationship between fertility and parenthood attitudes after diagnosis was also examined. Finally, we examined differences between these two groups on the extent health care professionals provided fertility information.

METHODS

Study design and Participants

This study employed a cross-sectional design. Portuguese women were recruited through the Gynecology Department of Santa Maria Hospital in Lisbon and Health Centers belonging to ACES Médio Tejo and ACES Baixo Mondego. Women were also recruited online through a web link containing information about the study. USA women were recruited from the Moffitt Cancer Center breast clinic. Ethical approval was obtained from the Institutional Review Boards at Moffitt and the Ethics Committees and Direction Boards in Portugal. Recruitment occurred between December 2012 and June 2015.

Eligible participants were breast cancer survivors who: underwent adjuvant therapy (chemotherapy, radiotherapy, hormonal therapy); were diagnosed at least 2 years before the study; were 18 to 40 years at recruitment; were not undergoing cancer treatment (except endocrine therapy); did not have other cancer diagnosis (except non-melanoma skin cancer); were able to write and read Portuguese language (Portuguese sample), English or Spanish language (USA sample). Written consent was obtained from all participants recruited through Health Institutions. Women recruited online consented to participate in the study by agreeing to respond to the questionnaires.

Procedure

Portuguese Sample

Health Institutions recruitment: Potential participants were screened via medical databases or when attending medical consultations and then approached by a medical team member to gauge interest. Interested women were then contacted by a research team member, who invited them to participate. Those who agreed were mailed a study description, a consent form, self-report questionnaires and a pre-stamped envelope with which to return the signed consent and questionnaires. Participants who did not return the questionnaires within two weeks were contacted again to prompt the return of the questionnaires.

Online recruitment: The study web link was disseminated by several Portuguese national breast cancer associations through their webpage, social media web sites (e.g. *Facebook*) and mailing lists. The web link was directed at Portuguese women, and contained information about the study, study eligibility criteria, anonymity and confidentiality and the questionnaires. It was clearly stated on the website, before women had access to questionnaires, that by completing the subsequent questionnaires they were consenting to participate.

USA Sample—Potential participants were identified via Moffitt Cancer Center cancer registry. Eligible participants were mailed a letter inviting study participation and a telephone number and email address to decline further contact. After two weeks, patients who did not opt out were mailed the questionnaires with a consent form (which included HIPAA Authorization information) and a pre-paid envelope to return the signed consent and questionnaires. Participants who did not return the packet within 2 weeks received a second

mailing. If no response was received within 4 weeks, a third mailing was sent. Participants were also approached at an upcoming clinic appointment. These women were given the option of signing the consent and completing the questionnaires in clinic or by mail.

Measures

Demographic and clinical Information—Age, marital status, education and employment status were collected via a standardized form. Race and ethnicity data were not collected in Portugal; therefore, data for the US sample were not reported. Participants self-reported their histological diagnosis, stage of disease and treatment type received. This information was verified in the USA sample through patient's medical records. A subjective rating of physical health was obtained by asking respondents to rate their physical health on a 10-point scale (0=extremely ill to 10= healthy, very well) [adapted 11]. Current and past mental health problems, current and past psychological treatment were also assessed (as present or absent).

Reproductive Information—Data on parity (i.e., the number of children/pregnancies) at the time of the study and before the diagnosis were collected. Women were asked if, at diagnosis, they already had their desired number of children.

Fertility and parenthood attitudes and decisions—A self-report questionnaire was specifically designed for this study. It comprised items on fertility attitudes and decisions and health care professionals' fertility-related information provision, with responses in a "yes" or "no" format. In addition, it contained 18 attitudinal statements about parenthood after cancer, answered using a 5-point scale, ranging from "disagree" to "agree". The selection of questions and statements was guided by the existing literature [12, 13] and investigators' clinical experience. A small pilot study was conducted with young Portuguese breast cancer survivors to confirm the suitability of this questionnaire for this population. Afterwards, through an extensive process of translation and back-translation, as well as expert panel review, which included bi-lingual and bi-cultural members, English and Spanish versions were developed. These versions were then tested for content, clarity and acceptability.

Analysis

Descriptive summary statistics (percentages or means and standard deviations as appropriate) are presented for demographic, clinical and reproductive characteristics, and fertility and parenthood measures. For comparisons between the two samples, chi-square tests were used for categorical measures of demographic/clinical characteristics, and fertility attitudes/decisions, t-tests for age, and Mann-Whitney U-tests for the parenthood attitudes. Relationships between demographic/clinical characteristics and fertility attitudes/decisions and parenthood measures were assessed using chi-square tests, t-tests, Mann-Whitney U-tests and correlations as appropriate. Statistical significance was set at $p \leq 0.01$ to adjust for multiple testing to reduce the likelihood of obtaining statistical significance "by chance". The statistical software package SPSS version 22.0 was used.

RESULTS

Sample characteristics

Participants included 59 Portuguese women and 43 USA women. Thirty-nine of the Portuguese women were recruited online; there were no significant differences on demographic variables between those and women recruited from health institutions. The mean age of the total sample was 36.6 years (SD = 4.0). There were only differences among Portuguese and USA samples on histological diagnosis and self-reported physical health status. Portuguese women were more likely to rate their physical health status as poorer (Portugal: means (SD)= 5.6 (2.3), USA: means (SD) = 8.1 (1.9); $p < 0.001$) (table 1).

Fertility attitudes and decisions

Few differences were found between Portuguese and USA women, with the exception that more USA women underwent FP (23% vs Portugal 5%, p=0.01). Table 2 summarizes results for the Portuguese sample, the USA sample and the total sample. Results for the relationship between fertility attitudes and demographic and clinical characteristics of the entire sample are also provided.

Attitudes and decisions towards parenthood after breast cancer

There were no significant differences between Portugal and USA, with the exception that Portuguese women were more likely to agree that a child meant a better quality of life (QOL) (Portuguese agree: 80% vs USA agree: 40% ; U= 624; p< 0.001) and to report their partners placed more value on family after their illness (Portuguese agree: 55% vs USA agree: 14%; U= 452.5; p< 0.001).

Overall, women reported positive attitudes, with 82% agreeing they felt healthy enough to perform the mother role and 59% stating that after their illness they changed or would change positively their behavior as a mother. Contrarily, a subset of women reported more negative attitudes, with 35% fearing the birth of a child would be a risk for cancer recurrence and 30% fearing that if they got pregnant their child would be born with health or genetic problems.

Table 3 presents results for each parenthood attitudinal statement for the Portuguese, USA and the total sample.

Relationship between attitudes and decisions towards fertility and parenthood for the entire sample

Importance of fertility issues after breast cancer diagnosis disclosure: Women who agreed were those for whom a child meant a better QOL (79% vs no importance 43%, U=629, p<0.001), had an increased motherhood desire (63% vs no importance 21%, U = 606, p<0.001), would consider adoption (58% vs no importance 31%, U=716, p=0.01), wished to be a mother or have more children (65% vs no importance 13%, U=382, p<0.001) and whose partners showed more desire to be a father (39% vs no importance 5%, U=517, p<0.001).

Worry about cancer treatment impact on future fertility: Women agreeing wanted to be a mother or have more children (59% vs no worry; 19%; U=491, p<0.001) and whose motherhood desires increased (64% vs no worry 18%; U=529, p<0.001).

Fertility concerns influenced timing and type of cancer treatments: Women who agreed wished to be a mother or have more children (72% vs no influence 33%, U=401, p=0.01), for whom motherhood represented a normal life (77% vs no influence 40%, U=397, p=0.01) and had motherhood desires increased (82% vs no influence 34%, U=302, p<0.001). They also agreed their partners' desire to be a father had increased (50% vs no influence 15%; U=273, p<0.001).

Fertility issues were not a priority because of interest of recovering from cancer: Women who agreed had diminished desire to be a mother (25% vs priority 3%; U=638.5, p=0.005).

Post-cancer treatment fertility concerns: Women with concerns wished to be a mother or have more children (76% vs no concerns 16%; U=333, p<0,.001), desire to be a mother increased (78% vs no concerns 20%; U=423, p<0.001), would consider adoption (65% vs no concerns 325%; U=580, p<0,.001) and whose partners displayed more desire to be a father (42% vs no concerns 10%; U=443, p<0,.001).

FP before cancer treatment: Women were more likely to preserve fertility if their partners' desire to be a father increased (55% vs no FP 18%, U=220, p<0,.001).

Health care professionals' fertility-related information provision

Overall, 71% of the women reported that fertility issues were discussed by their medical team during diagnosis and treatment phases. Fertility discussions were more likely to happen with younger women (means (SD)= 36.0(4.2), means (SD) = 38.4 (2.3); p = 0.006), for whom fertility issues became very important after diagnosis (p=0.007), and had fertility worries during diagnosis and treatment (p<0.001).

Overall, 78% reported that they were given the opportunity to express their fertility concerns during diagnosis and treatment phases. However, 12% felt they were not properly informed. Portuguese women were more likely to state they had not been properly informed (Portugal: 23% vs USA: 3%; p = 0.01). Women preferred to obtained fertility information from their oncologist (70%). Only Portuguese women sought their family medicine physician for fertility information (11%) (Table 4).

DISCUSSION

To our knowledge, this is the first study to compare two different cultural and linguistic populations on cancer fertility and childbearing attitudes and decisions. Our findings replicate the evidence that fertility issues become important for most women after breast cancer diagnosis [8], demonstrating that women value these issues regardless of culture, background or the heath system they belong to. Overall, there were few differences on attitudes and decisions between the USA and Portugal samples.

The most striking discrepancies concerned the use of ART and fertility-related information provided to women. USA participants were more likely to undergo FP than Portuguese participants. FP techniques are available in Portugal in the National Health System and in different private health institutions. FP interventions provided by the National Health System offer no-cost access, except for the medications for ovarian stimulation [14]. These findings are similar to others [15] demonstrating an underutilization of FP among cancer patients in single payer systems that would otherwise cover the expense. Since oncofertility in Portugal is still in an early development stage [16], these results may reflect the more established norms concerning reproductive health for USA cancer patients. Corroborating this view, our study shows a trend for USA women to report more fertility discussions with healthcare providers. In addition, Portuguese women were significantly more dissatisfied with their physician's fertility explanations. Comparatively, the USA's oncofertility research, policies and standards have been implemented longer and continue to evolve with newly emerging ART. In Portugal, there is still a paucity of data concerning fertility and childbearing in cancer patients. To our knowledge, the present study is the first to show Portuguese data on this topic. There is a clear need to provide fertility counselling to all young women with breast cancer. In 2016, the Portuguese Society of Oncology published recommendations concerning FP in cancer patients for the Portuguese population [14]. Concomitantly, various clinical intervention efforts have been made to strengthen the importance of fertility counselling for Portuguese cancer patients [16, 17]. Our results show oncologists are the preferred source of fertility information. However, similar to other studies [18, 19, 20], there is still a subset of patients who do not have fertility discussions, which suggests the frequency of fertility discussions is sub-optimal in clinical settings. Prior research has highlighted oncologists' lack of knowledge towards fertility preservation options among one of the reasons contributing to a lack of fertility discussions [21]. One interesting finding from our study highlights the family medicine physician as a potential source of fertility information in Portugal. Differences in participants' responses related to source of information may be attributed to the differing structures of each country's respective health care system.

Collectively, women viewed childbearing positively after diagnosis, with a minority reporting negative attitudes related to fears about their health or their future child's health. Published literature suggests no differences in survival for women who had pregnancies after a breast cancer [22]. A recent meta-analysis found pregnancy that occurred after breast cancer reduced the risk of death [23]. Clinical practice guidelines for fertility preservation in cancer patients support and recommend fertility discussions with all women newly diagnosed with breast cancer before the initiation of the cancer treatment. These discussions should comprise clear information about cancer treatment and effect on fertility, fertility preservation options and a referral to fertility specialists [24–26]. Furthermore, Pagini et al [27] evaluated interest in an international study of cessation of endocrine treatment to achieve pregnancy among 212 age eligible women with an early ER + breast cancer diagnosis and identified 37% were interested in potential participation. This study demonstrated that some women value childbearing after cancer and are willing to explore options even if outcomes are unknown. It is also imperative that patients are counselled regarding alternative family building options for those who were unable to use preservation

methods or for whom those methods were unsuccessful. Research indicates many survivors assume an increased cancer risk for their children without consulting a genetic counsellor [28]. These findings reinforce the premise that survivors' reproductive counselling needs do not end after the consultation for FP. Rather, reproductive aged survivors may have counselling needs that evolve over time, as attitudes concerning future parenthood may change throughout the cancer trajectory. Our results support the evidence that younger women and those without children before the diagnosis are more likely to place a greater importance on childbearing after cancer, reporting more fertility concerns [20, 29, 30]. For younger women without children, the threat of loss of childbearing capacity may be perceived as more worrisome and stressful, since many did not yet have the family they hoped for. Therefore, those women were more likely to have undergone FP or even considered adoption. This group of women may be more vulnerable for psychological difficulties, such as depressive symptoms [31]. Our findings also showed a relationship between fertility issues and women's perceptions of increased desires for fatherhood from their partners. This indicates partners may play a role in shaping their attitudes and decisions. Thus, psychosocial factors should be examined when attempting to understand women's decisions [32] and, particularly, we support the inclusion of women's significant others, particularly their partners, in fertility discussions [33].

There are limitations to this study. First, the sample size was small, due to the infrequent occurrence of breast cancer at reproductive age. Second, this was a cross-sectional retrospective study, so participants' responses may be affected by recall bias, since diagnosis occurred at least two years prior. Finally, it is possible women with the highest levels of interest in fertility were more willing to participate. These limitations may preclude the generalization of the findings. However, given the innovative nature of our study and the evident lack of research particularly in Portugal, our study has the potential to contribute significantly to research.

Collectively, fertility issues were very important for most of the women. Future prospective longitudinal studies should attempt to understand childbearing attitudes and decisions over time. Furthermore, studies should understand prospectively the implications of childbearing attitudes on psychological variables and QOL. This would be crucial to developing counselling interventions tailored to women's needs across their cancer journey, which may play a pivotal role in fertility decision-making. Future research should also examine the role of the family medicine physician in the provision of fertility counselling to young breast cancer survivors.

Conclusions

This is an unprecedented study that examined attitudes concerning fertility across survivors with cultural and linguistic differences, yet the similarities and not the differences are most remarkable. While every survivor's experience is unique, our findings suggest universality of certain attitudes, needs and motivations among young cancer patients. These findings support the need for policies that promote routine fertility and family building counselling for breast cancer survivors at multiple points during their cancer trajectory. Education on how to effectively inform patients about fertility are essential for those involved in cancer

management. [34]. In this context, the optimal role of the general health practitioner in fertility counselling should be further investigated.

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Abbreviations

ART	Assisted reproductive technologies
FP	Fertility Preservation
QOL	Quality of Life

References

1. Franasiak JM, , Jr, Scott RT. Demographics of cancer in the reproductive age females. In: Sabanegh ES, Jr, editorCancer and Fertility, Current Clinical Urology Switzerland: Springer; 2016 1119
2. Penberthy L, Desch CE, McDonald MK, Smith TJ, Retchin SM. Variation in staging and treatment of local and regional breast cancer in the elderly. Breast Cancer Res Treat. 1996; 40:75–86. [PubMed: 8888154]
3. Pronzato P, Mustacchi G, De Matteis A, Di Constanzo F, Rulli E, Floriani I, Cazzaniga ME. Biological characteristics and medical treatment of breast cancer in young women-a featured population: results from the NORA study. Int J Breast Cancer. 2011; 2011:534256. [PubMed: 22332011]
4. Tschudin S, Bitzer J. Psychological aspects of fertility preservation in men and women affected by cancer and other life-threatening diseases. Hum Reprod Update. 2009; 15:587–597. [PubMed: 19433413]
5. Peate M, Meiser B, Hickey M, Friedlander M. The fertility-related concerns, needs and preferences of younger women with breast cancer: a systematic review. Breast Cancer Res Treat. 2009; 116:215–223. [PubMed: 19390962]
6. Avis NE, Crawford S, Manuel J. Psychosocial problems among younger women with breast cancer. Psychooncology. 2004; 13:295–308. [PubMed: 15133771]
7. Ruddy KJ, Gelber S, Ginsburg ES, Schapira L, Abusief ME, Meyer ME, Partridge AH. Menopausal symptoms and fertility concerns in premenopausal breast cancer survivors: a comparison to age- and gravidity-matched controls. Menopause. 2011; 18:105–108. [PubMed: 21243735]
8. Gonçalves V, Sehovic I, Quinn G. Childbearing attitudes and decisions of young breast cancer survivors: A systematic review. Hum Reprod Update. 2014; 20:279–292. [PubMed: 24077938]
9. Partridge AH, Gelber S, Peppercorn J, Sampson E, Knudsen K, Laufer M, Rosenberg R, Przypyszny M, Rein A, Winer EP. Web-based survey of fertility issues in young women with breast cancer. J Clin Oncol. 2004; 22:4174–4183. [PubMed: 15483028]
10. Deshpande N, Braun I, Meyer F. Impact of fertility preservation counseling and treatment on psychological outcomes among women with cancer: A systematic review. Cancer. 2015; 12:3938–47.

11. Matthews AK, Aitken JE, Helmrich SP, Anderson DD, Herbst AL, Waggoner SE. Sexual functioning and mood among long-term survivors of clear-cell adencarcinoma of the vagina or cervix. J Psychos Oncol. 1999; 3:27–45.
12. Schover LR, Rybicki LA, Martin BA, Bringelsen KA. Having children after cancer: a pilot survey of survivors' attitudes and experiences. Cancer. 1999; 86:697–707. [PubMed: 10440699]
13. Braun M, Hasson-Ohayon I, Perry S, Kaufman B, Uziely B. Motivation for giving birth after breast cancer. Psychooncology. 2005; 14:282–296. [PubMed: 15386767]
14. Almeida Santos AT, Sousa G, Teixeira A, Cardoso P, Melo C, et al. Recomendações para a preservação do potencial reprodutivo no doente oncológico. Revista Portuguesa de Oncologia. 2016; 2:5–24.
15. Linkeviciute A, Boniolo G, Chiavari L, Peccatori FA. Fertility preservation in cancer patients: the global framework. Cancer Treat Rev. 2014; 40:1019–1027. 2014. [PubMed: 24953980]
16. Silva C, Almeida-Santos AT, Melo C, Rama ACR. Decision on Fertility Preservation in Cancer Patients: Development of Information Materials for Healthcare Professionals. J Adolesc Young Adult Oncol. 2017; 6:353–357. [PubMed: 28112543]
17. Ataman LM, Rodrigues JK, Marinho RM, Caetano JP, Chehin MB, et al. Creating a Global Community of Practice for Oncofertility. J Glob Oncol. 2016; 2:83–96. [PubMed: 27284576]
18. Quinn GP, Vadaparampil ST, King L, Miree CA, Wilson C, Raj O, Watson J, Lopez A, Albrecht TL. Impact of physicians' personal discomfort and patient prognosis on discussion of fertility preservation with young cancer patients. Patient Edu Couns. 2009; 77:338–343.
19. Louwé LA, Stiggelbout AM, Overbeek A, Hilders CG, van den Berg MH, Wendel E, van Dulmen-den Broeder E, Ter Kuile MM, et al. Factors associated with frequency of discussion of or referral for counselling about fertility issues in female cancer patients. Eur J Cancer Care (Engl). 2016 Oct 24.
20. Ruddy KJ, Gelber SI, Tamimi RM, Ginsburg ES, Schapira L, et al. Prospective study of fertility concerns and preservation strategies in young women with breast cancer. J Clin Oncol. 2014; 32:1151–1156. [PubMed: 24567428]
21. Biglia N, Torrisi R, D'Alonzo M, Codacci Pisanelli G, Rota S. Attitudes on fertility issues in breast cancer patients: an Italian survey. Gynecol Endocrinol. 2015; 31:458–464. [PubMed: 25982361]
22. Lambertini M, Kroman N, Ameye L, Cordoba O, Pinto A. Long-term Safety of Pregnancy Following Breast Cancer According to Estrogen Receptor Status. J Natl Cancer Inst. 2017 Oct 26.
23. Hartman EK, Eslick GD. The prognosis of women diagnosed with breast cancer before, during and after pregnancy: a meta-analysis. Breast Cancer Res Treat. 2016; 160:347–360. [PubMed: 27683280]
24. Loren AW, Mangu PB, Beck LN, Brennan L, Magdalinski AJ. Fertility preservation for patients with cancer: American Society of Clinical Oncology clinical practice guideline update. J Clin Oncol. 31:2500–2510. 201. [PubMed: 23715580]
25. Peccatori FA, Azim HA Jr, Orecchia R, Hoekstra HJ, Pavlidis N. Cancer, pregnancy and fertility: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol. 2013 Oct; 24(Suppl 6):vi160–70. [PubMed: 23813932]
26. Paluch-Shimon S, Pagani O, Partridge AH, Bar-Meir E, Fallowfield L. Second international consensus guidelines for breast cancer in young women (BCY2). Breast. 2016; 26:87–99. [PubMed: 27017247]
27. Pagani O, Ruggeri M, Manunta S, Saunders C, Peccatori F. Pregnancy after breast cancer: Are young patients willing to participate in clinical studies? Breast. 2015; 24:201–207. [PubMed: 25662412]
28. Fernandes-Taylor S, Adesoye T, Bloom JR. Managing psychosocial issues faced by young women with breast cancer at the time of diagnosis and during active treatment. Curr Opin Support Palliat Care. 9:279–284.
29. Gorman JR, Usita PM, Madlensky L, Pierce JP. Young breast cancer survivors: their perspectives on treatment decisions and fertility concerns. Cancer Nurs. 2011; 34:32–40. [PubMed: 20697269]
30. Howard-Anderson J, Ganz PA, Bower JE, Stanton AL. Quality of life, fertility concerns, and behavioral health outcomes in younger breast cancer survivors: a systematic review. J Natl Cancer Inst. 2012; 7:386–405. 104.

31. Gorman JR, Malcarne VL, Roesch SC, Madlensky L, Pierce JP. Depressive symptoms among young breast cancer survivors: the importance of reproductive concerns. Breast Cancer Res Treat. 2010; 123:477–85. [PubMed: 20130979]

32. Bekker H, Thornton JG, Airey CM, Connelly JB, Hewison J, Robinson MB, Lilleyman J, et al. Informed decision making: an annotated bibliography and systematic review. Health Technol Assess. 1999; 3:1–156.

33. Badr H. The importance of actively involving partners in oncofertility discussions. Future Oncol. 2016; 12:1679–82. [PubMed: 26952959]

34. Kim J, Kim KH, Mersereau JE. Building a successful fertility preservation program at a major cancer center. J Gynecol Oncol. 2014; 25:148–154. [PubMed: 24761219]

Highlights

- Fertility and childbearing are universally important for breast cancer survivors
- Few differences existed between Portuguese and USA survivors on childbearing attitudes
- Women viewed motherhood positively after breast cancer
- Health professional's fertility related information provision is suboptimal

Table 1

Demographic and clinical characteristics of the Portuguese sample, the USA sample and the total sample.

	Portuguese Sample (N=59) % (no.)	USA Sample (N=43) % (no.)	Total Sample (N=102) % (no.)
Age; mean(range)	36.3 (18,40)	36.95 (29,41)	36.59 (18,41)
Marital status			
Single/Divorced	23% (14)	17% (7)	21% (21)
Married	49% (29)	76% (32)	60% (61)
Co-habitating	20% (12)	5% (2)	14% (14)
In a relationship (not living with partner)	7% (4)		4% (4)
Widow		2% (1)	1% (1)
Education			
< University degree	37% (22)	42% (18)	39% (40)
> University degree	63% (37)	58% (25)	61% (62)
Professional situation			
Active	59% (35)	67% (29)	63% (64)
Other	41% (24)	33% (14)	37% (38)
Type of Tumour			
Ductal carcinoma in situ (DCIS)	36% (20)	19% (8)	28% (28) *1
Invasive ductal carcinoma (IDC)	55% (30)	81% (35)	64% (65)
Other	9% (5)	0% (0)	5% (5)
Stage of disease			
0	2% (1)	0% (0)	0% (0)
I	15% (7)	23% (10)	17% (17)
II	43% (20)	53% (23)	42% (43)
III	30% (14)	12% (5)	19% (19)
IV	9% (4)	12% (5)	9% (9)
Treatments			
Chemotherapy	86% (50)	86% (37)	85%(87)
Radiotherapy	76% (44)	60% (26)	69% (70)
Current physical health; mean(range)	5.6 (1,10)	8.1 (2,10)	6.6 (1,10) *2
Current mental health problem	25% (15)	31% (13)	28% (28)
Current psychological/psychiatric help	22% (13)	9% (4)	17% (17)
Past mental health problem	39% (23)	44% (19)	39% (40)
Past psychological/psychiatric help	39% (23)	40% (17)	39% (40)

	Portuguese Sample (N=59) % (no.)	USA Sample (N=43) % (no.)	Total Sample (N=102) % (no.)
Children	54% (32)	63% (27)	58% (59)
Number of children before diagnosis			
0	39% (23)	39% (15)	37% (38)
≥ 1	60% (35)	61% (23)	57% (58)
Before diagnosis, have desired children			
Yes	51% (30)	38% (15)	44% (45)
Unsure	8% (5)	15% (6)	11% (11)
No	37% (22)	48% (19)	40% (41)

*1 p=0.01,

*2 p < 0,001.

Table 2

Fertility attitudes and decisions of the Portuguese sample, the USA sample and the total sample.

	Portuguese Sample (N=59) % (N)	USA Sample (N=43) % (N)	Total Sample (N=102) % (N)
At the time of your breast cancer diagnosis, did fertility issues become very important to you?	56% (33)	44% (19)	52% (51)
During your cancer treatment, did you worry about the impact of treatment on your future fertility?	54% (32)	57% (24)	55% (56)
Did your concerns regarding fertility preservation influence the timing or type of cancer treatment you received?	10% (6)	29% (12)	18% (18)
During the diagnosis and treatment phases, were fertility issues not a concern and priority for you because you were more interested in your recovery from the cancer?	70% (41)	53% (23)	63% (64)
(post-treatment), are fertility issues still a concern for you?	48% (28)	28% (12)	39% (40)
Did you undergo fertility preservation procedures before initiating your breast cancer treatment?	5% (3)	23% (10)	13% (13) *1

*1 p=0.01

Table 3

Attitudinal statements towards parenthood after a breast cancer diagnosis for the Portuguese sample and the USA sample.

	% of those responding to question Portugal			% of those responding to question USA		
After my illness…	**Disagree** *1*	**Neutral**	**Agree** *2*	**Disagree** *1*	**Neutral**	**Agree** *2*
I feel sufficiently healthy to perform the mother role well	8% (4)	2% (1)	90% (48)	5% (2)	12% (5)	84% (36)
I changed/will change positively my performance as a mother	14% (7)	20% (10)	66% (33)	2% (1)	35% (15)	63% (27)
A child means for me a better quality of life **1*	6% (3)	14% (7)	80% (39)	19% (8)	40% (17)	40% (17)
I wish very much to be a mother/have more children even if I do not know what the future will bring to me	40% (19)	15% (7)	45% (21)	35% (15)	26% (11)	37% (2)
Being a mother represents to me having again a normal life	29% (14)	24% (12)	47% (23)	19% (8)	35% (15)	40% (20)
Having a child is a blessing	4% (2)	11% (6)	85% (45)	2% (1)	7% (3)	91% (39)
The desire to be a mother increased	41% (21)	16% (8)	43% (22)	26% (11)	28% (12)	42% (18)
Having a child is too stressful for me	72% (37)	18% (9)	10% (5)	74% (32)	14% (6)	9% (4)
I changed my maternity plans	37% (18)	10% (5)	53% (26)	54% (23)	19% (8)	28% (12)
The desire to be a mother diminished	67% (31)	13% (6)	20% (9)	67% (29)	16% (7)	12% (5)
I think it would be selfish to have a child	62% (28)	16% (7)	22% (10)	74% (32)	19% (8)	7% (3)
I fear that the birth of a child would be a risk for my illness to return	36% (17)	15% (7)	49% (23)	49% (21)	21% (9)	30% (13)
I fear that if I get pregnant my child would be born with health/genetic problems	39% (17)	20% (9)	41% (18)	34% (15)	34% (25)	30% (13)
My financial resources to educate a child well became limited	53% (25)	17% (8)	30% (14)	42% (18)	37% (16)	21% (9)
If I am not able to have the children I desire, I will consider adoption	34% (16)	15% (7)	51% (24)	35% (15)	26% (11)	40% (17)
My husband/partner/boyfriend places more value on the family **2*	14% (6)	31% (13)	55% (23)	44% (19)	40% (17)	14% (6)
My husband/partner/boyfriend shows more desire to be a father	32% (14)	40% (17)	28% (12)	33% (14)	49% (21)	16% (7)
My husband/partner/boyfriend shows less desire to be a father	51% (22)	35% (15)	14% (6)	44% (19)	47% (20)	7% (3)

**1* $p<0.001$;

**2* $p<0.001$;

1 Disagree/moderately disagree;

2 Agree/moderately agree

Table 4

Health care professionals' fertility-related information provision for the Portuguese sample, the USA sample and the total sample.

	Portuguese Sample (N=59) % (N)	USA Sample (N=43) % (N)	Total Sample (N=102) % (N)
During the diagnosis and treatment phases, were fertility issues mentioned and discussed by your doctor and/or other health professionals?	68% (40)	74% (32)	71% (72)
During the diagnosis and treatment phases, did you have the opportunity to ask questions and express your concerns about fertility and future pregnancy to your doctor?	76% (45)	79% (34)	78% (79)
If you answered Yes, were you properly informed?	80% (36)	97% (32)	68% (67) *1
Source of fertility information provision			
Oncologist	64% (38)	77% (33)	70% (71)
Nurses	27% (16)	16% (7)	23% (23)
Family Medicine Physician	19% (11)	0% (0)	11% (11) *2
Support Groups	7% (4)	7% (3)	7% (7)
Internet	34% (20)	23% (10)	29% (30)
Leaflets	15% (9)	7% (3)	12% (12)
Other patients	14% (8)	2% (1)	9% (9)
Other Source	24% (14)	19% (8)	22% (22)

*1 p=0.01;

*2 p=0.002