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ORIGINAL ARTICLE – BREAST ONCOLOGY

Lactation Education for Surgeons: American Society of Breast Surgeons (ASBrS) Survey Demonstrates Strong Member Interest in Expanded Training

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ABSTRACT

Background. The availability and extent of breastfeeding-specific surgical training has not been previously described. We aimed to survey breast surgeons on their lactation education and desire for additional knowledge.

Methods. Members of the American Society of Breast Surgeons were invited via email to anonymously complete an electronic survey from 27 October 2021 to 23 January 2022. The survey content included demographic information, sources of lactation education, and desired topics and methods for further training. Descriptive statistics were used to analyze the data.

Results. A total of 2698 surveys were delivered and 542 (20.1%) completed. While nearly all respondents (99%) reported treating lactating patients at least once or twice per year, 78% reported that their training was inadequate. The most frequently cited sources of lactation information were peer-to-peer informal knowledge sharing (50%) and personal experience with breastfeeding (44%). Nearly all respondents (99%) agreed that formal lactation education would benefit breast surgeons. Specific topics of interest included management of patients with complications of lactation (48%), management of lactating patients with a new diagnosis of breast cancer (47%), and counseling patients with pregnancy-associated breast cancer who desire to breastfeed (46%). The most frequently recommended educational formats included presentation at a national conference (60%), evidence-based management guidelines (58%), webinar (55%), and workshop/course (47%).

Conclusion. Breast surgeons self-report minimal formal training in the management of benign and malignant breast disease in lactating patients and strong desire for expanded education. Development of clinical practice guidelines and additional educational content for surgeons should be considered to meet the needs of this patient population.

Breastfeeding is associated with decreased infant mortality and morbidity, as well as decreased maternal rates of breast and ovarian cancers.[1] The World Health Organization (WHO) and American Academy of Pediatrics (AAP) recommend exclusive breastfeeding for 6 months with continued breastfeeding for at least 2 years.[2,3] While 83% of women in the USA initiate breastfeeding, only 25% of infants are breastfed exclusively for 6 months, and only 36% receive any breastmilk at 12 months of age.[4] Complications of lactation are a major cause of early cessation of breastfeeding, with women suffering from lactational mastitis being nearly six times as likely to stop breastfeeding earlier than desired.[5] Access to high-quality medical and surgical care is therefore essential to supporting breastfeeding women and children. As the age at first childbirth continues to rise in the USA,[6] and national breastfeeding rates improve,[4] the numbers of women who are pregnant or lactating at the time of breast cancer screening[7] or diagnosis[8] are increasing. Further, survivors of young women's breast cancer (YWBC) may wish to interrupt adjuvant therapy to have children and breastfeed.[9]

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Despite the volume of women breastfeeding and needing appropriate medical and surgical care, patients often struggle to identify knowledgeable physicians who can provide effective treatment. Gaps in knowledge may result from insufficient lactation education during medical school, residency, and fellowship. Anecdotally, many breast surgeons express limited familiarity with caring for breastfeeding patients. In addition to managing the intersection of breast cancer treatment and lactation in survivors of newly diagnosed patients, breast surgeons may be asked to care for patients with the most challenging complications of lactation, such as complex abscesses.

The availability and extent of breastfeeding-specific surgical training has not been previously described. We sought to survey practicing breast surgeons on their previous exposure to lactation education, confidence in management of benign and malignant breast conditions occurring during lactation, and desire for additional training. The specific aims were to (1) delineate the extent and nature of lactation education received by breast surgeons, (2) identify specific lactation topics most relevant to their clinical practice, and (3) identify the appropriate timing and delivery of lactation education during a breast surgeon's training and career.

METHODS

An electronic survey was administered via email to physician members of the American Society of Breast Surgeons (ASBrS) from 27 October 2021 to 23 January 2022. Active (board-certified surgeons practicing breast surgery), associate (non-board-certified surgeons or non-surgeon physicians), candidate (general surgery residents or surgical fellows), and retired members were invited to participate; affiliate members (licensed allied healthcare professionals, researchers, or scientists) and patient advocate members were excluded. After the first email invitation was delivered on 27 October 2021, two reminder e-mails were sent on 5 October 2021 and 10 January 2022 prior to survey closure on 23 January 2022. Participation was voluntary and identifying information was not collected to ensure anonymity.

The survey was designed to take approximately 5 min to complete. Beta testing was performed prior to distribution, and based on feedback, language was refined to optimize clarity. The survey collected demographic information including gender, geographic region, practice setting, and clinical experience; extent and type of lactation education; confidence in managing breastfeeding-specific clinical scenarios; and desired topics and methods for further education. There was also an opportunity to provide comments. The survey questions are available in the Supplemental Materials.

Responses were collected through the survey instrument (SurveyMonkey) and saved electronically. Only responses from completed surveys were included in the analysis. Responses to Likert scale questions about confidence in managing clinical scenarios were converted to numerical scores. "Extremely confident" was scored as 5, "very confident" as 4, "moderately confident" as 3, "slightly confident" as 2, and "not at all confident" as 1. Statistical analyses were performed in JMP Pro, version 15.0.0, SAS Institute Inc. (Cary, NC). Data were analyzed using descriptive statistics, including measures of central tendency and variability. Chi-square tests and *t*-tests were performed to evaluate responses by years in practice (≤ 10 years vs. > 10 years, with exclusion of current residents and fellows from these analyses), receipt of fellowship training (yes versus no), and gender (male versus female; "prefer not to say" was excluded from these analyses due to low number of responses in this category). Statistical significance was defined as a p-value of < 0.05.

RESULTS

In total, 2785 surveys were sent electronically, of which 87 (3.1%) bounced back, 1987 (71.3%) were opened, and 631 (22.7%) were clicked through. Of the 2698 surveys delivered, 542 (20.1%) were completed.

Demographics

Respondent demographics are detailed in Table 1. Most respondents were female (80.4%) and practice in the USA (91.1%). Current trainees comprised 3.7% of total respondents, and 2.0% were retired surgeons. A total of 329 (60.7%) completed training more than 10 years ago, and just over half (53.0%, 264 out of 498) completed a fellowship in breast surgical oncology or complex general surgical oncology. The top three practice settings were hospital or health-plan employed/community setting (38.9%), academic (32.7%), and private practice (25.8%).

Nearly all respondents (99.1%) reported treating lactating patients with benign or malignant breast disease at least once per year; more specific frequencies are illustrated in Fig. 1A. Most (72.5%) reported referring patients to lactation consultants at least once per year; detailed referral frequencies are illustrated in Fig. 1B.

Extent and Type of Lactation Education

Most respondents (78.0%, $n = 423$) reported that their training in the management of lactating patients with breast disease was inadequate, while 63 (11.6%) felt it was adequate and 56 (10.3%) were unsure. Responses differed significantly by gender ($p = 0.0003$), with a greater proportion of males than females expressing that their training was adequate (17.7% versus 10.1%) or that they were

TABLE 1 Survey respondent demographics

Characteristic	*N* (%)
Gender	
Female	436 (80.4%)
Male	102 (18.8%)
Prefer not to say	4 (0.7%)
Years since completing surgical training	
Current resident or fellow	20 (3.7%)
< 5 years	98 (18.1%)
5–10 years	95 (17.5%)
11–20 years	130 (24.0%)
> 20 years	199 (36.7%)
Completion of breast surgical oncology or complex general surgical oncology fellowship*	
Yes	264 (53.0%)
No	234 (47.0%)
Primary practice setting	
Academic employed/university	106 (19.6%)
Academic employed/community	71 (13.1%)
Hospital or health-plan employed/community	211 (38.9%)
Private practice	140 (25.8%)
Veterans Administration Hospital or government employed	3 (0.6%)
Retired	11 (2.0%)
Geographic region	
Midwest	121 (22.3%)
Northeast	124 (22.9%)
South	156 (28.8%)
West	93 (17.2%)
Outside the USA	48 (8.9%)

*Current residents and fellows were instructed to skip this question. A total of 44 respondents did not answer this question

unsure (18.6% vs. 8.3%; Fig. 2). Response distributions did not vary significantly by years in practice ($p = 0.4929$) or receipt of fellowship training ($p = 0.9764$).

Reported sources of lactation information are detailed in Table 2. The most frequently cited sources were informal in nature, including peer-to-peer informal knowledge sharing (50.2%) and personal experience with breastfeeding (43.9%). In contrast, formal sources of knowledge, including medical school education (7.6%), residency training (13.7%), fellowship training (16.6%), and textbooks (14.8%), were reported much less frequently. Thirty respondents commented with resources not listed on the answer selections, including obstetrics-gynecology (OB-GYN) residency, lactation consultant training, consultation with lactation consultants, on-the-job experience, personal research, online research, ASBrS community forums, and the Facebook group Doctor Mothers Interested in Lactation Knowledge (Dr. MILK).[10]

Self-reported Confidence in Managing Breastfeeding-Specific Clinical Scenarios

Survey participants were queried about their level of confidence in their ability to manage eight breastfeeding-specific clinical scenarios. Results are displayed in Table 3. Overall, very few respondents expressed feeling "not at all confident" in their ability to manage these scenarios, with proportions ranging from 1.1 to 12.9%. The scenario for which respondents reported highest level of confidence overall was managing lactating patients with benign breast disease, with a mean score of 4.1 corresponding to "very confident." In contrast, the lowest overall level of confidence was managing patients with pregnancy-associated breast cancer (PABC) who desire to breastfeed, with an average score of 3.1 corresponding to "moderately confident." Mean responses differed significantly by years in practice for all eight scenarios, with surgeons who completed training > 10 years ago reporting higher levels of confidence than those who completed training ≤ 10 years ago (Table 3). Responses also significantly differed by gender, with males reporting a higher level of confidence than females for all scenarios except one related to complications of lactation (Table 3).

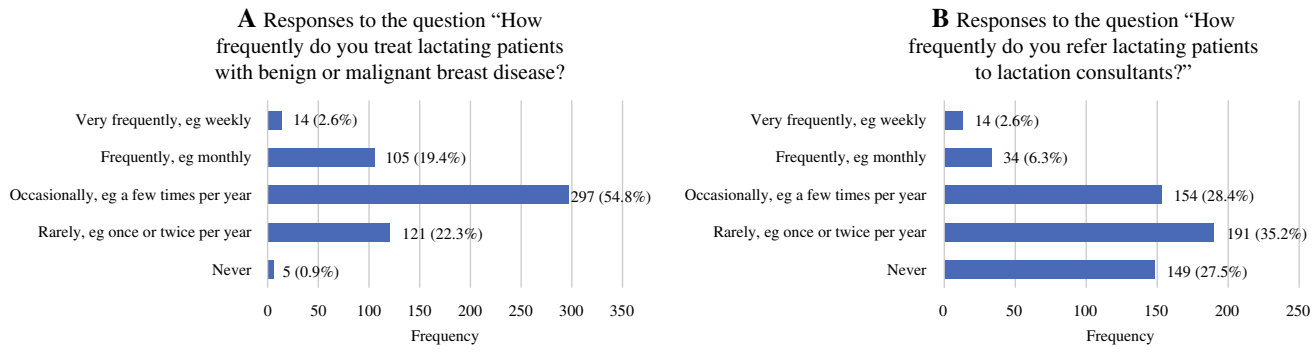

FIGURE 1 Distribution of response to questions about frequency of **A** treating lactating patients and **B** referring patients to lactating consultants.

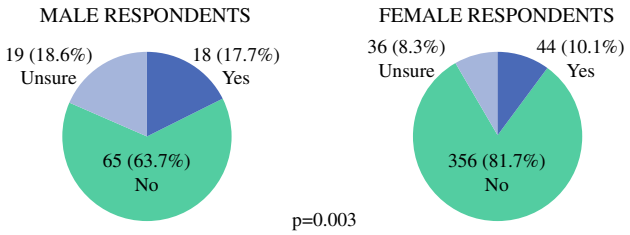

FIGURE 2 Distribution of response to the statement "My training in the management of lactating patients with breast disease was adequate", stratified by gender: **A** male, **B** female.

Neither receipt of fellowship training (yes versus no) nor personal experience with breastfeeding (yes vs. no) was significantly associated with mean responses to any of the eight clinical scenarios ($p > 0.05$).

Desired Topics and Methods for Further Lactation Education

Nearly all respondents (99.1%, $n = 537$) agreed that formal lactation education would be of benefit to breast surgeons, while only five (0.9%) did not feel formal education is necessary. Recommendations for optimal timing of training included medical school (3.7%, $n = 20$), residency (22.1%, $n = 120$), fellowship (39.9%, $n = 216$), clinical practice (6.6%,

TABLE 2 Responses to the question "Which of the following most contributed to your knowledge regarding management of lactating patients with breast disease?" with instructions to select up to three answer choices

Source of lactation information	*N* (%)
Medical school education	41 (7.6%)
Residency training	74 (13.7%)
Fellowship training	90 (16.6%)
Workshop or course	30 (5.5%)
Webinar	47 (8.7%)
Presentation at a national conference	157 (29.0%)
Textbooks	80 (14.8%)
Published manuscripts/journal articles	109 (20.1%)
Evidence-based guidelines	66 (12.2%)
Personal experience with breastfeeding (you, family members, friends)	238 (43.9%)
Peer-to-peer informal knowledge sharing, e.g., colleagues, an online forum, or a social media group	272 (50.2%)
Resources shared by patients, e.g., websites	26 (4.8%)
None	20 (3.7%)
Other (please specify)	30 (5.5%)

TABLE 3 Confidence levels reported by survey participants for managing eight clinical scenarios. Data are presented as means (standard deviations)

Clinical scenario	Overall	Years since completion of training		*p*-value	Gender		*p*-value
		≤ 10 years	> 10 years		Female	Male	
Patients with complications of lactation (e.g., mastitis, abscess, galactocele)	3.9 (0.9)	3.8 (1.0)	4.1 (0.9)	0.0009	3.9 (1.0)	4.0 (0.9)	0.4274
Lactating patients with benign breast disease (e.g., fibroadenoma)	4.1 (0.9)	3.8 (1.0)	4.3 (0.8)	< 0.0001	4.0 (1.0)	4.2 (0.8)	0.0081
Lactating patients with a new diagnosis of breast cancer	3.9 (1.0)	3.6 (1.1)	4.1 (0.9)	< 0.0001	3.8 (1.1)	4.1 (0.9)	0.0206
Patients with pregnancy-associated breast cancer (PABC) who desire to breastfeed	3.1 (1.3)	2.9 (1.2)	3.3 (1.3)	< 0.0001	3.1 (1.3)	3.4 (1.2)	0.0116
Breast cancer survivors who desire to breastfeed	3.5 (1.2)	3.2 (1.2)	3.7 (1.1)	< 0.0001	3.4 (1.2)	3.7 (1.1)	0.0464
Patients who have undergone breast surgery in the past for benign disease (e.g., fibroadenoma) who desire to breastfeed	4.0 (1.0)	3.7 (1.1)	4.2 (0.9)	< 0.0001	4.0 (1.0)	4.2 (0.9)	0.0091
Lactating patients in need of breast cancer screening or diagnostic studies	3.7 (1.1)	3.4 (1.1)	3.9 (1.0)	< 0.0001	3.7 (1.1)	4.0 (0.9)	0.0009
Pregnant or lactating patients in need of core needle biopsy or surgery	3.8 (1.0)	3.4 (1.1)	4.1 (0.9)	< 0.0001	3.7 (1.0)	4.0 (0.9)	0.0109

$n = 36$), and all of the above (26.8%, $n = 145$). The most frequently recommended educational formats were presentation at a national conference (60.1%, $n = 326$), evidence-based management guidelines (58.5%, $n = 317$), webinar (54.6%, $n = 296$), and workshop/course (46.5%, $n = 252$). Other educational format options included peer-to-peer informal knowledge sharing such as an online forum or social media group (22.3%, $n = 121$), published manuscripts/journal articles (20.7%, $n = 112$), and textbooks (7.9%, $n = 43$). Eight respondents (1.5%,) commented with the following additional suggested formats: fellowship-based curriculum, a rotation with a lactation consultant or OB-GYN, a website, and the Breast Education and Self-Assessment Program (BESAP).

Survey participants were queried about specific topics to include in breast surgeon-specific lactation education. Respondents had the option to select from a list of suggested topics, which were based on the prior clinical scenarios and/or to share their own recommendations. Most respondents (81.7%) indicated that all suggested topics (detailed in Table 4) should be included in lactation education for breast surgeons. In addition, 14 respondents commented with additional suggested topics (Table 4).

Finally, survey participants were invited to share additional comments or considerations regarding breastfeeding and lactation education for breast surgeons. A total of 160 respondents (29.5%) provided free-text comments. The majority were positive, thanking the ASBrS for the survey and emphasizing the need for expanded training. Many comments promoted specific educational formats, particularly the following: ASBrS consensus guidelines, webinars, more presentations at national meetings, and a half-day pre-course meeting. Several comments expressed the opinion that nonsurgical breastfeeding-specific conditions should be managed by another specialty, such as primary care or OB-GYN. Representative comments are shown in Box 1.

DISCUSSION

In this survey of ASBrS members, the majority of breast surgeons self-reported inadequate training in the management of benign and malignant breast disease impacting lactating patients and strong desire for expanded education. These survey data demonstrate that lactation knowledge among breast surgeons is obtained largely through informal means such as peer-to-peer discussions and personal experience with breastfeeding. Breast surgeons who participated in this survey expressed near-universal interest in formal educational resources encompassing a breadth of breastfeeding-related surgical topics to be delivered through diverse formats. Overall, these survey results highlight a gap in breast surgical training and represent an opportunity for development of formal educational strategies.

Breast surgeons in our study reported markedly lower rates of adequate training in lactation than physicians of other specialties (OB-GYN, pediatrics, family practice) who participated in a similar survey about breastfeeding-related physician education (22% vs. 50–81%).[11] Despite most breast surgeons describing their lactation training as inadequate, self-reported levels of confidence in managing breastfeeding-related clinical scenarios were relatively high, with mean scores corresponding to "moderately confident"

TABLE 4 Distribution of responses to the question "Which of the following topics should be included in lactation education for breast surgeons?" (Multiple selections were permitted)

Response	*N* (%)
None, no formal education is necessary	0 (0.0%)
Management of patients with complications of lactation (e.g., mastitis, abscess, galactocele)	261 (48.2%)
Management of lactating patients with benign breast disease (e.g., fibroadenoma)	202 (37.3%)
Management of lactating patients with a new diagnosis of breast cancer	256 (47.2%)
Counseling patients with pregnancy-associated breast cancer (PABC) who desire to breastfeed	250 (46.1%)
Counseling breast cancer survivors who desire to breastfeed	212 (39.1%)
Counseling patients who have undergone breast surgery in the past for benign disease (e.g., fibroadenoma) who desire to breastfeed	162 (29.9%)
Advising patients about breast cancer screening or diagnostic studies during lactation	218 (40.2%)
Advising pregnant or lactating patients in need of core needle biopsy or surgery	196 (36.2%)
All of the above	443 (81.7%)
Other*	14 (2.6%)

*Free-text comments included the following: basic lactation knowledge including physiology of lactation and weaning, breast exams during lactation, when to stop breastfeeding, counseling lactating patients about piercings, medication/anesthesia and breastfeeding, granulomatous mastitis occurring during lactation, counseling nulliparous patients in need of benign breast surgery regarding risks of future breastfeeding challenges, and management of nonsurgical breastfeeding complications such as mastitis, nipple trauma, pain, nipple blebs, plugged ducts, and low breastmilk production

BOX 1 Representative free-text comments selected from 160 responses

"Need more formal education on this topic from the ASBrS—thank you for doing this."
"Very important topic which we see a lot of and did not get any formal training."
"Similar to education in nutrition, I think there is a deficit in lactation education in medical training."
"This is long overdue. Some surgeons may think they know, but they don't. I've cleaned up a lot of messes in lactating women over the years."
"Training should be at the residency level in particular since a fair amount of breast surgery is still performed by general surgeons across the US... or the general surgeon is the initial consultant. We still see patients advised to stop lactation unnecessarily or withholding care while lactating."
"Definitely would be beneficial to have more evidence based guidelines."
"Please do a full day conference and make all the talks searchable in the library. Books and papers get out of date too fast."
"It is integral for our training. We should all be encouraged to pursue certification in lactation since we have the most knowledge in the anatomy and physiology of the breast. Lactation is simply a part of that spectrum that should not be ignored."
"Much needed. Unfortunately, most breast surgeons are cancer-oriented and mastitis and breast abscesses are a major inconvenience however there is no one else who does it other than ER docs. General surgeons don't want to since we take away the cancers."
"I actually do not want to see many of these folks since I concentrate on cancer surgery rather than non operative breast issues."
"I see a lot of these patients. I do not, however, want to get referrals for blocked ducts and pain and latching problems, etc. I actively have refuse [sic] to see these. There definitely is a problem with OBs and lactation consultants not understanding the role of a surgeon, don't want to invite 'all comers' when it comes to lactating moms."
"I believe obstetricians should manage most lactational complications."

to "very confident." In contrast, physicians from other specialties who participated in the survey by Meek and colleagues reported comparatively lower levels of comfort managing clinical scenarios, with only 50–53% describing that they "somewhat" or "strongly" believed that they had received adequate training to provide clinical evaluation of and treatment for breastfeeding problems. Although it is not possible to directly compare these groups, the discrepancy between breast surgeons and other physicians with respect to extent of training and levels of confidence may reflect differences in confidence in treating patients with breast disease overall. The accuracy and effectiveness of breast surgical care of lactating patients may warrant further evaluation with objective measurements.

This survey also revealed several additional findings regarding confidence in clinical management. First, female surgeons self-reported lower levels of confidence in management of nearly all scenarios compared to male surgeons. Congruent with our findings, a survey of general surgery residents found that female sex was independently associated with lower levels of self-reported confidence in their technical skills and ability to operate independently.[12] It is possible that the higher confidence levels self-reported by male surgeons were partly attributable to the higher proportion of males reporting their training was adequate compared with female respondents; however, we are unable to explain why perceptions about the adequacy of training differ between the two groups. Second, breast surgeons who completed training more than 10 years ago reported higher confidence than surgeons with fewer years of training. In contrast, Meek and colleagues found that OB-GYNs, pediatricians, and family practitioners with more years of training were less likely to report that they received adequate training to manage lactation-specific clinical scenarios, with physicians practicing for fewer than 5 years reporting the highest rates of comfort with clinical training.[11] This may reflect recent improvements in residency and fellowship curricula focused on breastfeeding-related topics. Indeed, a prospective, multicenter controlled trial of a novel breastfeeding medicine residency curriculum developed by the American College of Obstetricians and Gynecologists (ACOG), the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP), and the Association of Pediatric Program Directors demonstrated that trainees exposed to the curriculum reported higher levels of knowledge and confidence in breastfeeding management than those with exposure to standard residency training alone.[13]

It is important to note that not all respondents felt breast surgeons should be treating breastfeeding-related conditions. Several suggested that OB-GYNs or primary care physicians should manage the bulk of lactational issues and refer these patients to breast surgeons more selectively. However, a survey of program directors of family medicine and OB-GYN residencies revealed that trainees in these specialties receive only 8–23 h of breastfeeding education across their entire residency experience.[14] As evidenced by the survey by Meek and colleagues, deficiencies in lactation education exist across multiple specialties. To this end, the Centers for Disease Control and Prevention (CDC) developed a program to increase breastfeeding-related physician education and training, including at the medical school level, which includes curricula, learning collaboratives, and model policies.[15]

While lactation education was felt to be important across all levels of training and clinical experience, survey respondents expressed that this education would be of particular value during fellowship. Breast surgery fellowship is 1 year of post-graduate training dedicated to the comprehensive management of breast disease, with focus on

multidisciplinary and surgical management. This may represent the ideal time to gain additional skills in the management of lactating patients, similar to other unique patient populations encountered in clinical practice. Indeed, a 2012 survey of breast surgical oncology fellowship graduates noted that fewer surgeons felt well-prepared to treat benign disease (71%) than to perform breast cancer surgery (98%) upon completion of fellowship training.[16] Over the past several years, steps have been taken to augment the fellowship curricula related to breastfeeding. The August 2019 update of the Breast Surgical Oncology Fellowship Curriculum and Minimum Training Requirements included "lactational mastitis" and "peripartum issues surrounding physiologic breast changes, breast feeding, and breast health" under the benign breast disease requirements, as well as "pregnancy-associated/lactation-associated breast carcinoma" under the malignant breast disease requirements.[17] Additionally, in 2022, a 1-h webinar titled "Management of the Lactating Breast" was added to the Fellows Didactic Series.[18] Similar curricular changes should be considered at the residency level, as a substantive proportion of breast surgery is performed by general surgeons who may not complete a fellowship in breast surgical oncology or complex general surgical oncology. In addition, the aforementioned CDC curricula[15] could be considered for inclusion in general surgery residency didactics.

These survey results highlight an opportunity for surgical training programs and societies to ensure expanded formal lactation education is available to all trainees and practicing breast surgeons. Educational content could reflect the specific topics and formats recommended by breast surgeons who participated in this survey. Evidence-based practice management guidelines, which were strongly desired by survey participants, should be considered to establish standards of care and facilitate high-quality care for breastfeeding women with surgical breast conditions. Additionally, opportunities exist to create instruments to evaluate competence in breast surgical care of lactating patients, such as options for certification signifying expertise in this particular area.

This study is limited by selection bias inherent to survey research. However, recruiting survey participants through ASBrS allows for approximation of a cross-sectional study of current training and practicing breast surgeons, and avoids the biases and limitations of convenience samples resulting from recruitment through social media groups. A response rate of 20.1% is concordant with response rates of recent ASBrS surveys, which ranged from 13 to 22%.[19–21] Additionally, the overwhelming number of free-text responses suggest strong interest in further engaging in this topic area.

In conclusion, based on the results of this survey, it is clear that additional resources are needed to support breast surgeons in caring for breastfeeding women with benign and malignant breast conditions. Development of evidence-based guidelines, augmentation of lactation education in medical school and postgraduate medical training, and expansion of continuing medical educational content should be considered to improve care for breastfeeding patients.

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