Original Article



# A qualitative study of the patient experience related to post-mastectomy flat closure and perspectives of the BREAST-Q

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**Background:** Applicability of the BREAST-Q survey to the flat closure experience after mastectomy is unknown, as it was primarily designed to assess patients who undergo breast reconstruction. Thus, we aimed to investigate the guiding values and quality-of-life outcomes of patients who choose flat closure and assess if the BREAST-Q adequately captures these experiences.

**Methods:** Between February and May 2024, we performed 18 1-hour semi-structured interviews with flat closure patients, identified through institution chart review and purposive sampling on social media, to explore their perioperative experiences and applicability of the BREAST-Q survey. A standardized interview template was developed with input from a plastic surgeon specialized in breast reconstruction, patient feedback, and current literature. Recruitment was complete once thematic saturation was achieved. Transcripts were coded on Dedoose Online Software and analyzed using a Grounded Theory-informed approach. Phenomenological interpretations of excerpts are presented.

**Results:** Analysis of flat closure patients' perioperative experiences revealed 11 themes relating to: experiences with surgeons, experiences with other providers, education, community support, advocacy, motivating factors, financial and insurance considerations, body image and aesthetics, prosthetics use, physical impacts, and sexual impacts. Of note, we identified that most patients reported never being presented with flat closure as an option following mastectomy. Further, we found that online flat closure communities were critical to patients as they provided information, connection, and empowerment. Overall, participants noted that the BREAST-Q generally lacks an assessment of patient ability to fulfill familial duties, community support, pre-operative relationship to breasts, sources of reconstructive information, or prosthetic use. Specific to the flat closure community, participants remarked that the repeated language of "women" and "breasts" throughout the BREAST-Q is not inclusive and many questions were not applicable to their experience.

**Conclusions:** Primary results reveal that community is the cornerstone of perioperative experiences for individuals opting for flat closure after mastectomy. Community provided most resources that guided decision-making, suggesting a potential gap in information provided by surgeons. Further, the sense of judgement participants occasionally felt in their decision highlights potential surgeon bias and the influence of societal beauty standards, necessitating patients to self-educate and then self-advocate, often against physicians pushing for reconstruction. Analysis revealed modules within the BREAST-Q use exclusive language, and many do not adequately capture the full range of experiences they are designed to measure. Overall, these results reveal a need for increased edification on the merits of flat closure and allow providers to understand that certain factors may be of higher value to different patients.

**Keywords:** Post-mastectomy flat closure; BREAST-Q survey; patient-reported outcome measures; quality of life; qualitative analysis

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## Introduction

### *Background*

Although post-mastectomy breast reconstruction continues to advance in terms of techniques and availability, up to 60% of patients elect to undergo flat closure (1-4). Flat closure entails creating a smooth, flat chest wall contour through excision of excess tissue following mastectomy (5). Despite the popularity of this option, there is limited data about the values, decision-making processes, and perioperative experiences of this patient population.

A 2016 article in the New York Times revealed pervasive anecdotal reports of "flat-denial", wherein surgeons disregarded patients' requests for flat closure following mastectomy—either by persuading them to undergo reconstruction or by intentionally leaving excess skin to preserve the possibility for future reconstruction despite patients' explicit preferences (6). This journalistic discourse has been affirmed by both qualitative and quantitative data reporting flat denial, bias toward reconstruction during counseling, and inadequate education on all surgical options, as the strongest predictors of patient dissatisfaction with surgical outcomes (7-10).

**Highlight box**

**Key findings**
- Most patients were never presented with flat closure as an option following mastectomy.
- Online flat closure communities were critical to patients as they provided information, connection, and empowerment.
- The BREAST-Q's repeated language of "women" and "breasts" is not inclusive.

**What is known and what is new?**
- Surgeons often disregard patients' requests for flat closure following mastectomy—termed "flat denial".
- Using BREAST-Q, flat closure patients are reported to have lower quality-of-life scores
- Community is the cornerstone of perioperative flat patient experiences.
- Modules within the BREAST-Q use exclusive language, and many do not adequately capture the full range of experiences they are designed to measure.

**What is the implication, and what should change now?**
- Flat closure patients are satisfied and empowered, suggesting a need for increased education on the merits of flat closure for plastic surgery providers.
- Adjustments need to be made to the BREAST-Q to ensure inclusivity, either through a flat closure adjunct or an updated version of the survey.

### *Rationale and knowledge gap*

While the BREAST-Q survey was developed to provide a comprehensive assessment of the physical, psychological, and quality of life outcomes after mastectomy (11,12), the applicability of the BREAST-Q survey to the flat closure population is unknown. Studies using BREAST-Q have reported lower quality-of-life scores for flat closure patients in comparison to breast reconstruction patients (7). Alternative tools to BREAST-Q have found that 74–83% of patients who undergo flat closure are satisfied with their decision and aesthetic outcome (7,10,13,14). This discrepancy is likely in part due to bias in the BREAST-Q survey, which includes items that do not apply to the experience of flat closure patients and lacks a "not applicable" option, leading flat closure patients to score lower by design. Moreover, a retrospective review from our institution analyzing flat closure outcomes using BREAST-Q revealed a negative emotional impact on patients taking the survey due to its poor inclusivity (13).

### *Objective*

Given that a substantial proportion of patients choose flat closure following mastectomy, there is a critical need to better understand their experiences. Enhancing the BREAST-Q to reflect the flat closure experience would improve its inclusivity and utility, enabling more accurate assessment of patient satisfaction and quality of life. This qualitative study aims to explore perioperative experiences of patients undergoing flat closure and to evaluate the

efficacy of the BREAST-Q in capturing their experience. Insights from this study will guide the development of a modified patient-reported outcomes measure (PROM) tool that is inclusive of the flat closure patient experience. We present this article in accordance with the SRQR reporting checklist (available at https://abs.amegroups.com/article/view/10.21037/abs-25-41/rc).

## Methods

### *Design*

We designed a qualitative interview guide to explore the perioperative experiences of patients who underwent post-mastectomy flat closure and to assess the perceived relevance and applicability of the BREAST-Q survey to outcomes for this population. The study was conducted in accordance with the Declaration of Helsinki and its subsequent amendments. This study was approved by the University of California, San Francisco Institutional Review Board (No. 19-29615) and informed consent was obtained from all individual participants. All data was deidentified and stored in a secure cloud system.

### *Sampling & recruitment*

Patients who underwent post-mastectomy flat closure at our institution between 2014 and 2022, with English as their primary language, were retrospectively identified and contacted through email. Those who expressed interest were sent an electronic consent form and completed a 60-minute Zoom interview. At the end of each interview, participants were asked to connect us with others in their community with similar surgical experiences (snowball sampling). To increase diversity across race, ethnicity, age, gender identification, and sexual orientation, participants also shared a study summary, provided by the research team, in private flat closure Facebook groups (purposive sampling). Recruitment continued until thematic saturation was achieved, which was determined by interviewer consensus when no new themes emerged from interviews.

### *Semi-structured interview*

The interview guide was developed by a team comprised of a plastic surgery attending, plastic surgery residents, and medical students. A semi-structured format with open-ended questions was used to facilitate candid, unbiased reflections on flat closure experiences. Questions were informed by prior patient feedback and peer-reviewed literature (12,13,15). Topics explored included: participants' pre-operative discussions; post-operative quality of life; and general emotional response to the BREAST-Q survey and its perceived relevance to their flat closure experience. Participants were free to skip any question that made them uncomfortable. We piloted this survey with two participants prior to full implementation and met weekly thereafter to make adjustments to the structure of the interview as needed. Each interview concluded with an invitation for participants to share any additional thoughts not previously addressed to ensure comprehensive capture of their experiences.

### *Data analysis*

Interview transcripts were auto-generated by Zoom and reviewed by researchers for accuracy and removal of any protected-health information using Microsoft Word Online version 16.88. Transcripts were imported into Dedoose Online Software version 9.2.007 [2024] for thematic analysis (16). Using a Grounded Theory-informed approach, data analysis began with open inductive coding of five transcripts by two authors (R.B.H. and A.P.) (17-19). Each line of text was open for the generation of new codes without being bound by pre-existing theories. Codes were then analyzed and grouped into categories to generate a codebook. Codes generated during this process helped identify new concepts that were further explored in subsequent interviews. The first five transcripts and the remaining thirteen transcripts were then re-coded using a uniform codebook by four authors (R.B.H., A.P., M.C., and S.B.). R.B.H. and A.P. coded the same nine interviews while M.C. and S.B. coded the other nine. Each pairing met often to review transcripts for inter-coder agreement and resolve discrepancies. If the pair was unable to come to consensus, they referred the question to the other pair to achieve group consensus. Transcripts were also inductively coded for participant feedback on potential modifications to the BREAST-Q to enhance its relevance for individuals who undergo flat closure. Upon conclusion of the coding phase, quotes related to each code were exported to Microsoft Word Online version 16.88 and analyzed for themes. An iterative phenomenological interpretation was conducted by multiple team members through careful consideration of excerpts to avoid superficial categorization and ensure

**Table 1** Participant demographics and survey length

| SID | Age (years) | Relationship status | Educational status | Racial/ethnic demographic | Gender identity | Interview length |
|---|---|---|---|---|---|---|
| 1 | 70 | Married | Some college | White | Female | 1:04:27 |
| 2 | 70 | Divorced or separated | Graduate | White | Female | 2:09:37 |
| 3 | 63 | Divorced or separated | Bachelor's | White | Female | 1:09:42 |
| 4 | 73 | Widowed | Graduate | White | Female | 1:01:35 |
| 5 | 56 | Married | Graduate | White | Female | 1:15:30 |
| 6 | 62 | Married | Bachelor's | White | Female | 1:13:35 |
| 7 | 53 | Married | Graduate | White | Female | 1:26:53 |
| 8 | 52 | Married | Graduate | Hispanic | Female | 1:00:03 |
| 9 | 45 | Married | Graduate | Asian | Female | 1:15:03 |
| 10 | 52 | Long-term partner | Graduate | White | Female | 1:15:17 |
| 11 | 52 | Married | Graduate | White | Female | 0:48:23 |
| 12 | 43 | Long-term partner | Graduate | White | Female | 1:10:38 |
| 13 | 43 | Divorced or separated | Graduate | White | Female | 0:47:24 |
| 14 | 34 | Married | Graduate | White | Female | 1:05:50 |
| 15 | 32 | Married | Bachelor's | White | Non-binary | 0:56:57 |
| 16 | 56 | Widowed | Graduate | White | Female | 1:13:33 |
| 17 | 69 | Married | Graduate | White | Female | 1:13:57 |
| 18 | 47 | Married | Bachelor's | White | Female | 0:48:54 |

Summary of baseline demographic characteristics for the study cohort. Average age was 54 years, average survey time was 1:09:51, and a majority were white patients with higher education. SID, study identifier.

understanding of underlying values and emotions related to the flat closure experience (9,14,20).

### *Researcher reflexivity*

None of the researchers on the analysis team has a personal history of or with breast cancer, nor were part of the treatment team for the patients included in this study. One researcher (R.B.H.) conducted the majority of the patient interviews and subsequently participated in data analysis. We acknowledge that her dual role may have introduced interpretive bias, shaped by rapport with participants and prior exposure to the data. As aspiring reconstructive surgeons, all authors brought a professional investment in understanding patients' experiences, which may have influenced the coding framework and interpretive lens. To mitigate these influences, we engaged in regular team debriefings and reflexive discussions throughout the analysis process, highlighting how our training backgrounds, gender identities, and clinical aspirations may have shaped our interpretations.

## Results

### *Patient demographics*

A total of eighteen patients, mean age 54 years (range, 32–73 years), were interviewed for an average time of 1:09:51 (range, 0:47:24–2:09:37) (*Tables 1*,*2*). Participant 15 had technical issues, where only half the interview was transcribed. Deductive thematic analysis revealed 11 themes, which are expounded upon below with pertinent quotes detailed in *Table 3*. Findings from inductive coding for potential modifications to the BREAST-Q are summarized in *Table 4*. Suggestions for edits not limited to the flat closure patient experience are included in Table S1.

**Table 2** Participant surgical details

| SID | Year of mastectomy | Flat closure surgeon | Geographic location | Flat closure: primary or secondary reconstruction |
|---|---|---|---|---|
| 1 | 2019 | Breast | Bay Area, CA, USA | Primary—received DIEP flap later |
| 2 | 2020 | Plastic | Bay Area, CA, USA | Primary |
| 3 | 2021 | Plastic | Bay Area, CA, USA | Primary |
| 4 | 2021 | Plastic | Rome, Italy (mastectomy + flat)<br>San Francisco, CA, USA (revision) | Primary |
| 5 | 2022 | Breast | Las Vegas, NV, USA (residence)<br>San Francisco, CA, USA (surgery) | Secondary—revision after DIEP flap |
| 6 | 2022 | Plastic | Oakland, CA, USA | Primary |
| 7 | 2023 | Breast | New Jersey, USA | Primary |
| 8 | 2021 | Plastic | California, USA | Primary |
| 9 | 2023 | Plastic | Undisclosed | Primary |
| 10 | 2012—L mastectomy with implant<br>2019—R mastectomy and flat closure with implant removal | Plastic | Sacramento, CA, USA | Secondary for L, primary for R |
| 11 | 2021 | Breast | Santa Fe, NM, USA | Primary |
| 12 | 2023 | Breast | New Mexico, USA | Primary |
| 13 | 2022 | Plastic | Salt Lake City, UT, USA | Secondary—revision after implants |
| 14 | 2023 | Plastic | Philadelphia, PA, USA | Primary |
| 15 | 2022 | Plastic | Tennessee, USA | Primary |
| 16 | 2024 | Plastic | San Diego, CA, USA | Primary |
| 17 | 2022 | Breast | North Carolina, USA | Primary |
| 18 | 2021 | Breast | Undisclosed | Primary |

Eleven participants had plastic surgeons complete their flat closure. Nine had surgeries on the West Coast, 2 on the East Coast, and 5 in the South/Southwest. Fifteen chose flat closure for their primary reconstruction. DIEP, deep inferior epigastric perforator; L, left; R, right; SID, study identifier.

### *Operative experiences thematic analysis*

#### Theme 1: experiences with surgeons

While patient experiences varied, the quality of patient-provider relationships was largely determined by empathetic, informative communication and respect for patient autonomy. The most positive consultations involved surgeons who explained all options clearly, used visual aids, and actively involved patients in decision-making (quotes 1,2).

However, most patients reported negative experiences with their surgeons where they felt dismissed, inadequately informed, and pressured towards reconstruction. Patients used phrases such as "treated like a child" [study identifier (SID)3] and "there was zero transparency" (SID9). Many noted that flat closure was never presented as an option (quotes 3,4) and when patients inquired about flat closure, they often encountered resistance from surgeons who continued to advocate for reconstruction (quotes 5,6). Some patients were told that flat closure would diminish their sense of femininity or that age should impact their decision making (quote 7). Some reported that their surgeons had no experience with flat closure or outright refused to perform it, undermining patient trust (quotes 8,9). Others expressed confusion about the plastic surgeon's role in their care (quote 10).

**Table 3** Qualitative analysis themes with descriptions and exemplar quotes

| Themes and descriptions | Quotes | |
|---|---|---|
| Experiences with surgeons: quality of patient-provider relationships and consultations relied on empathetic and effective communication that provided substantial information on flat closure as a reconstructive option | (I) | SID7: "*One plastic surgeon told me I would not look like a woman anymore. One told me I'd look like a prepubescent boy.*" |
| | (II) | SID7: "*None of the plastic [surgeons] really wanted to do it. One guy said, 'I don't make money on flat closures.'*" |
| | (III) | SID8: "*The general surgeon did a good job explaining what he could do. He even drew diagrams on the exam table paper. It was really great.*" |
| | (IV) | SID10: "*I was pretty much offered one option of implant reconstruction. I will just mention that flat was never even offered to me, and I didn't think of it.*" |
| | (V) | SID11: "*When I said I don't want any reconstruction, [the surgeon] kind of looked at me like I was a nutshell and told me to think about it and come back.*" |
| | (VI) | SID12: "*Eventually my questions were answered, but [the surgeon] wasn't very open to answering. She did it under duress, but didn't enjoy it.*" |
| | (VII) | SID13: "*I would have loved to have gotten more details about the actual procedures.*" |
| | (VIII) | SID14: "*I just assumed that [the breast surgeon] knew what he was doing… I don't know the difference between what a breast surgeon versus a plastic surgeon bring into this to be honest.*" |
| | (IX) | SID14: "*He went through every possibility. He drew pictures for me. He drew on my chest. This doctor was phenomenal.*" |
| | (X) | SID15: "*Obviously I would have preferred they had given it as an option in the first place, because if I hadn't done any looking into it on my own I wouldn't have known because they only presented implants or DIEP flap.*" |
| | (XI) | SID15: "*I had to really continue to push to get that particular surgery… [My breast surgeon] just didn't get it. They kept saying, 'Oh, well, you're so young!' Well, what does that have to do with anything, what does it matter how old I am?*" |
| | (XII) | SID15: "*When I told the doctor I'm considering flat closure they basically said, 'Well, we don't do that.' And I was like 'You don't? You wouldn't even consider doing that?' And they're like, 'No.'*" |
| Experiences with other providers: similar to surgeons, staff knowledge of flat closure has a significant impact on the patient experience and needs to be improved to provide empathetic and accurate pre- and post-operative care to patients | (I) | SID5: "*When I was flat and I went through all my testing and I was talking to medical professionals, they always referred to the flat side as my breast. And it pissed me off. It was triggering to me. I would go and get my MRI and they're like, 'Okay, You're going to get an MRI on your left breast.' And I'm like, 'No. I don't have a left breast. I'm getting it on my chest.'*" |
| | (II) | SID5: "*I know you guys are a teaching facility but I felt like I was a case study that [the student] has to go through and [do a] check box homework assignment.*" |
| | (III) | SID8: "*It's funny when you see a care provider or an intake nurse who will say, 'Are you having any pain in your breasts?' I always laugh and say, 'I don't have breasts… I didn't mean to make you feel awkward but it's a weird question when you don't have breasts anymore.'*" |
| | (IV) | SID14: "*My medical team's knowledge of flat closure compared to my surgeon was completely different… I shouldn't have to explain [flat closure] every time I go meet with a new doctor.*" |
| Education: patients often self-educated on the benefits and drawbacks of various reconstructive options by engaging with flat closure communities and other online resources | (I) | SID3: "*I have some familiarity with research and how to look up stuff [so I used PubMed]. And I called friends. I have numerous Oncology faculty that I used to work with… and I would talk to the Dean of the School of Medicine as a friend.*" |
| | (II) | SID6: "*Women aren't educated on their choices well enough. Everything happens so fast.*" |
| | (III) | SID6: "*I wasn't able to find one place, other than the Facebook groups, where I could get that information.*" |
| | (IV) | SID6: "*I had everything I needed from them. Hearing what other people did and what they had ready for and how they prepared. And then I also had seen tons of pictures so we knew what to expect.*" |
| | (V) | SID13: "*Seeing other women's photos, hearing their stories, that made the biggest difference. Being able to see what [flat closure] looked like on other women, and seeing how empowered they felt, that was a huge part of my decision making for flat closure.*" |
| | (VI) | SID15: "*There are very robust resources for this online. I feel like the community of people that have made this choice recently are very passionate about it being an option, and they take a lot of personal time, often unpaid, to make sure that that is available for other people going through the same thing. I felt very well prepared. But not because of anything my doctor gave me but because I involved myself in those communities.*" |
| Community support: patients choosing flat closure had to seek alternative sources of support that are distinct from complex reconstruction patients. In addition to practical advice, online flat closure communities provide significant emotional support to patients both during the decision-making process and the post-operative recovery period | (I) | SID10: "*We're fine. We're happy. We're dancing. This is a healthy, valid choice, and it doesn't make you any less to choose this. It's not a backup choice. It could be your primary choice. We just want to normalize it.*" |
| | (II) | SID10: "*I was her first flatty hug, too, and it's just like such a thing. Because it just feels different when your hearts are just like right there, and there's nothing in the way. And I also think about the implants, They're cold, they're hard. They just… hugs hit different when you're flat.*" |
| | (III) | SID11: "*I have to say I joined this Facebook group called Flat Fierce Forward… it's a fun ride to be part of that community. It made me feel better about my decision. It made me realize that there's a whole group of women that are doing this. It's not just me alone in the woods in New Mexico. So joining that community was really fun for me and it made me feel less like a freak.*" |

**Table 3** (*continued*)

**Table 3** (*continued*)

| Themes and descriptions | Quotes | |
|---|---|---|
| Advocacy: due to the stigma associated with flat closure, patients often have to defend and advocate for their decision with providers and family. This pre-operative experience often translates into patients becoming flat closure community leaders and advocates | (I) | SID4: "*I organize conferences with the UN.*" |
| | (II) | SID6: "*I definitely needed to be an advocate for myself.*" |
| | (III) | SID 6: "*I am a peer counselor and I have spoken to literally hundreds of women.*" |
| | (IV) | SID6: "*Not putting on a shirt has done all the legislative stuff and you know has gotten [flat closure] registered as an official reconstructive process with the American Cancer Society.*" |
| Motivating factors: motivating factors for the decision to go flat were multifactorial, though faster recovery and avoidance of complications were predominant concerns | (I) | SID1: "*I hated my breasts at that point because they were making my life miserable.*" |
| | (II) | SID6: "*The idea of being flat didn't bother me. I also thought if I was flat I could use boobs and be any size I wanted at any point.*" |
| | (III) | SID6: "*I really wanted the cancer out of my body. The idea of having breasts was not appealing to me at that point because of the fear of reoccurrence.*" |
| | (IV) | SID8: "*Complications that could come along with getting implants and expanders like breast implant illness and not being able to lay on your stomach really disturbed me. When I heard about the 12-hour surgeries for a TRAM or DIEP flap, I'm just going, no, that that doesn't appeal to me either. I don't want to be unconscious and in the ICU afterwards and deal with the extended recovery.*" |
| | (V) | SID10: "*The flaps surgeries are too extensive.*" |
| | (VI) | SID10: "*There was this sense of being inauthentic. The level of fake was too much for me, and I never really adapted to that well.*" |
| | (VII) | SID11: "*I wanted the least complicated surgery. I wanted the most tissue removed. I wanted the least number of surgeries. I just wanted it to be easy and as quick as possible.*" |
| | (VIII) | SID11: "*I think my view of my breasts were these are engines of my doom and if I can get rid of them, why wouldn't I?*" |
| | (IX) | SID11: "*I never loved being a large breasted person. I was always kind of jealous of people who had easier movement. So yeah, I wasn't even worried about being flat. I was kind of excited.*" |
| | (X) | SID12: "*That's another layer of complication. Anytime that there's something external put into your body. It's another surgery that my body could reject. If not now, down the road it could cause other issues. I was looking for the least amount of invasion.*" |
| Financial and insurance considerations: financial and insurance coverage is difficult for patients to understand and the impact on reconstructive decision making is variable | (I) | SID5: "*Insurance tells you no for everything immediately so if you don't know how to navigate the system, you're not going to survive.*" |
| | (II) | SID6: "*My insurance covered it so I didn't really think about the cost really.*" |
| | (III) | SID11: "*The financial anxiety was the big thing.*" |
| | (IV) | SID13: "*Finances were a big consideration for me. I'm living paycheck to paycheck right now... So it was literally 3 calendar years in a row where I had met my out-of-pocket max.*" |
| Body image and aesthetics: the goal of achieving a feminine appearance and the definition of femininity was highly individualized, but most patients did not attribute their breasts to their sense of self nor their gender identity and often found strength and satisfaction in their post-operative flat appearance despite needing to adjust their wardrobes and styles | (I) | SID1: "*One thing that changed dramatically was when I was concave I started layering clothes. I never wore just one shirt. I always wore something over because I felt better about my body with clothes on than with clothes off.*" |
| | (II) | SID3: "*I obviously thought about it and decided my femininity isn't in my breasts.*" |
| | (III) | SID3: "*My quality of life is back like it was before I had the surgery.*" |
| | (IV) | SID4: "*It looks very neat… that felt good because you were comfortable.*" |
| | (V) | SID4: "*Self-confidence doesn't come just from having or not having breasts. I hope it comes from other things. I feel as normal as other people. I don't see myself any less or more than other women.*" |
| | (VI) | SID6: "*I have no regrets. I'm really glad I did it.*" |
| | (VII) | SID 6: "*I'm a lot more than my boobs and it's not like this was a real choice… I have cancer, these are my battle wounds.*" |
| | (VIII) | SID8: "*I feel 1000% like aesthetic flat closure was the right decision for me. I did have a quick recovery with no complications. I was able to get back to my life very quickly. Adjusting to not having breasts wasn't a huge thing for me.*" |
| | (IX) | SID10: "*Could not be happier. No regrets.*" |
| | (X) | SID11: "*I felt a little bit freakish. I tried wearing the knockers and I just felt like a poser and they felt weird and plus were really uncomfortable. I had no idea how uncomfortable they were.*" |
| | (XI) | SID13: "*I feel thrilled every day about having a flat closure. I'd say I feel stronger, more feminine.*" |
| | (XII) | SID13: "*I quite literally feel stronger because I can see my pec muscles moving. I can literally see my strength now. I feel less limited, athletically. I don't wear a sports bra anymore... And that feels really strong too.*" |
| | (XIII) | SID13: "*I am happier in general, with my body, with my clothes and the way that they fit.*" |
| | (XIV) | SID15: "*I'm still figuring out what clothes fit me right. I just bought a bathing suit for the first time since [the surgery] and that's obviously a super different shopping experience.*" |
| | (XV) | SID16: "*My breasts don't define who I am… [flat closure] doesn't change who I am or what gender I am.*" |

**Table 3** (*continued*)

**Table 3** (*continued*)

| Themes and descriptions | Quotes | |
|---|---|---|
| Prosthetics use: due to social expectations of the female gender, patients sometimes felt pressured to align with this image by using prosthetics despite difficulties in acquisition and discomfort. | (I) | SID1: "*They were really uncomfortable because they're heavy.*" |
| | (II) | SID5: "*Going flat was very embarrassing. If I ever walked around without a prosthetic, everybody just immediately looked down and was like, 'What's wrong with you?'*" |
| | (III) | SID5: "*I tried to walk around without one but I didn't like the embarrassment. So it got to the point where I did wear a prosthetic every day just so I would look normal.*" |
| | (IV) | SID5: "*Every time I went through airport security I had to get a pat down because they thought I was hiding drugs in my bra every single time… and I [had to say] I have a mastectomy, you don't need to pat me down.*" |
| | (V) | SID10: "*Some of my [peers] have had experiences where they've gone into a public restroom, and they've been challenged about what gender they are, and if they should be in there.*" |
| Physical impacts: flat closure patients experience unique longitudinal physical impacts but their return to activities of daily living is significantly easier and quicker than complex reconstruction patients | (I) | SID2: "*I've still got keloid all the way as far as you can go,*" |
| | (II) | SID3: "*[iron bra syndrome feels] as if your chest had been encased in concrete... I constantly, feel like I'm wearing a bra that's about 10 sizes too small… which is interesting given that I'm flat and don't wear a bra.*" |
| | (III) | SID5: "*The radiation caused so much damage that I just had pain every day. So when she did the first surgery, she cut out a lot of the fibroid tissue. Honestly it was worth it just for that because it was literally pain everyday… I finally feel like a human being again.*" |
| | (IV) | SID7: "*I came home [from surgery] at 4:30. I had a conference call at 6:30. So I got on my conference call. And I was fine.*" |
| | (V) | SID10: "*I don't worry about it every day. It doesn't interfere with my daily activities and does not keep me for enjoying my life.*" |
| | (VI) | SID13: "*I had full range of motion back [quickly]. And I have no limitations or pain.*" |
| | (VII) | SID13: "*I feel less limited, athletically. I don't wear a sports bra anymore. I feel like freed up. And that feels really strong too.*" |
| | (VIII) | SID15: "*I can run now which is cool. That wasn't something I've done since I was like 15.*" |
| | (IX) | SID15: "*It's like when people get phantom limb pain but it was phantom nipple pain.*" |
| Sexual impacts: following flat closure, some patients found return to intimacy difficult due to pharmacological side effects and physical body changes | (I) | SID2: "*[I know] people whose husbands' left them after they had their breast removed. It was a deal breaker for them. Or whose husbands have never touched them sexually again and won't talk about it.*" |
| | (II) | SID2: "*I honestly can't even imagine what it would be like to introduce my body to a man or to even find a man attracted to me because of my body. I think at this point of life it's going to have to be because of my personality and I'll just have to find somebody who's accepting of my body. But that's like a night and day kind of an experience from before cancer surgery to after cancer surgery.*" |
| | (III) | SID2: "*Although I feel less female after [treatment]. Not only because the breasts are missing, but because of it messing with my whole concept of sexuality, messing with my sex drive. And a lot of people who have had this surgery go on aromatase inhibitors, which totally wipe out all of their estrogen. And then they just feel divorced from their sexuality and have such vaginal dryness, sex isn't pleasurable for them. And they're in relationships so it causes a lot of friction.*" |
| | (IV) | SID10: "*I do miss them just very mildly from like a stimulation standpoint. It's a source of pleasure. But you find workarounds, it's not the end of the world. It's just a very mild longing.*" |
| | (V) | SID10: "*'Will [I] ever be attractive to someone?' … 'Will anybody ever desire me again?'*" |

The 11 themes extracted from survey data are: experiences with surgeons, experiences with other providers, education, community support, advocacy, motivating factors, financial and insurance considerations, body image and aesthetics, prosthetics use, physical impacts, and sexual impacts. DIEP, deep inferior epigastric perforator; ICU, intensive care unit; SID, study identifier; TRAM, transverse rectus abdominis myocutaneous; UN, United Nations.

**Table 4** BREAST-Q feedback applicable to flat closure patients

| Module | Suggested additions | General constructive feedback |
|---|---|---|
| Overall BREAST-Q | Ability to fulfill familial duties | Inconsistent tense, present tense would be more appropriate than past tense |
| | Assessment of community support | Repeated language of "women" and "breasts" is not inclusive |
| | Pre-op relationship to breasts/chest | |
| | Sources of information/education | |
| | Prosthetic use | |
| Module 1: psychosocial well-being | Judgement in social settings | Section assumes what a "normal" female body is. Questions 'of equal worth to other women' and 'normal' are inappropriate and trigger uncomfortable emotions |
| | Judgement in professional settings | Change wording from "feminine" to "comfortable" as femininity is not the goal for all |
| | Accepting of new self | Questions are worded in a way that shows bias towards patients who underwent reconstruction |
| | Prosthetics use | |
| | Not applicable option | |
| Module 2: sexual well-being | Dating experiences | Assumes sexuality is tied to breasts. Many other factors play a larger role |
| | Desirability | Is not inclusive of all sexualities |
| | Willingness to initiate | Should come near the end of the survey as it contains sensitive/triggering content |
| | Breastfeeding | |
| | Impact of prosthetics on sexual activity | |
| | Not applicable option | |
| Module 3: cancer worry | Recurrence | Cancer worry never ceases thus this module does not feel productive to patients |
| | Survivor guilt | Question 25 should be reframed from daily activities to quality of life |
| | Impact on loved ones | |
| Module 4: fatigue | Ability to do activities of daily living | Fails to capture longitudinal experience as fatigue is two pronged: post-surgical and long term |
| | Sleep changes | Does not capture emotional fatigue |
| | | Mood is not an appropriate word to use in this module as it doesn't capture the intended experience |
| | | Negative valence assumes experience |
| Module 5: impact on work | Cessation of work | Needs expanded definition of work to include obligations such as taking care of kids, running a home, etc. |
| | Impact on coworker relationships | Lacks an assessment of the emotional aspect of returning to work, solely focusing on the practical |
| | Physical appearance at work | |
| | Not applicable option | |

**Table 4** (*continued*)

**Table 4** (*continued*)

| Module | Suggested additions | General constructive feedback |
|---|---|---|
| Module 6: physical well-being: chest | Common post-operative symptoms: Numbness, tightness beyond breast/chest area, cording, itchiness, neurogenic pain, lymphedema, phantom pains, diverting, scarring, erythema, range of motion limitations | Negative valence assumes experience |
| | Iron bra syndrome | Symptoms are not limited to the chest, often extending to torso and back |
| | Effects on sleep (side sleeping, stomach, pain, pulling) | Module needs to be consistent in language use of chest over breast |
| | | Ambivalent about the use of "aesthetic" flat closure, as not all patients find it applicable to their experience |
| Module 7: satisfaction with breasts | Prosthetics use | Adjust to "Being able to wear clothing that you want?" since not all prefer fitted clothing |
| | Needed new clothing/bathing suits/bras | Bra question may/may not be applicable depending on patient |
| | Not applicable option | Change language to "chest" or "silhouette" |
| | | Fails to capture emotional impact |
| | | No assessment of baseline happiness with appearance. Assumes positive prior experience and current negative experience |
| Module 8: adverse effects of radiation | Expand questions to include effects on muscle, bone, skin pigmentation, skin thinning, nerve damage, scarring, long term effects of radiation | Radiation section not applicable for those undergoing prophylactic surgery |
| | Experience with radiation oncology | |
| | Not applicable option | |
| Module 9: satisfaction with surgeon | Reconstructive options and risks discussed | Questions require differentiation between breast and plastic surgeon |
| | Individualized treatment plan | Clarify time frame of satisfaction with surgeon, over several months or several years |
| | Provided consistent information | |
| | Supportive of decision | |
| | Provided post-op resources | |
| Modules 10 and 11: satisfaction with medical team and office staff | Availability for follow up | Unclear which team is referenced (differences exist between medical, nursing, and office teams) |
| | Did you experience empathy | Staff need to be knowledgeable |
| | Effective/clear communication | |

Specific feedback relating to flat closure patients' experiences while completing the BREAST-Q are detailed in this table. Please see the supplemental appendix for a list of all suggestions about the BREAST-Q.

Overall, patients felt they were not given enough details about any reconstructive options (quotes 11,12). One patient stated, "Nobody talked to me about reconstruction in a way that made any sense to me", (SID1). As a result, many patients had to self-educate and self-advocate for their treatment.

**Theme 2: experiences with other providers**

Patients report being frustrated at the differing levels of knowledge and awareness about flat closure across medical and surgical teams. Some found terminology used by staff members triggering, such as the continued use of "breast" to describe their flat chest (quote 1). In general, post-operative care felt rushed, and many patients lamented the lack of physiotherapy post-operatively.

**Theme 3: education**

Patients expressed frustration over the lack of comprehensive information from providers on flat closure, implant risks, and long-term outcomes (quote 1). This prompted them to turn to external resources for guidance, including Facebook groups, Google, flat websites, PubMed, friends, and family, both in and out of medicine (quote 2). Peer-driven platforms, particularly Facebook groups and online forums, were cited as critical resources and often perceived as more helpful than provider guidance, offering emotional support, visual examples, and personal stories (quotes 3,4). Patients especially valued resources that included imagery, preoperative preparation, and detailed post-operative accounts (quotes 5,6).

**Theme 4: community support**

Family and community support played a key role in helping participants navigate the social challenges of flat closure. Patients reported both support and opposition from family and friends—especially from parents concerned about future regret or loss of femininity. In contrast, most partners respected patients' bodily autonomy. Despite anxiety about identity, social judgement, and pressure from others, most patients emphasized making empowered, independent decisions.

In addition to practical advice, online flat closure communities provide significant emotional support throughout decision-making and post-operative recovery. These spaces helped patients feel less isolated and, for some, instilled a sense of pride in going flat (quotes 1,2). These support groups organized community events such as retreats, walks, and bike rides, further strengthening connection. Many patients described the significance of their first 'flatty hug', an embrace with another flat-chested patient where you can sense the other's heartbeat (quote 3). A few younger participants noted challenges in connecting with others in these online groups that skew older demographically.

**Theme 5: advocacy**

Due to the stigma surrounding flat closure, patients felt compelled to defend their decision to both providers and family (quote 1). This often led them to become flat closure advocates sharing, "*I want to normalize flat. I don't want people to go through the experience I did where it wasn't even offered to them. I want people to see that you can choose flat, and you can be happy and healthy and you don't have to be fearful*" (SID18). Patients described becoming peer support therapists, organizing community events, and speaking at scientific conferences to increase awareness (quotes 2–4).

**Theme 6: motivating factors**

Despite external pressure to undergo reconstruction, most patients chose flat closure for its simplicity, shorter recovery time, flexibility, and lower risk of complications (quotes 1–4). Avoidance of foreign materials, discomfort with implants, concerns about recurrence, and body authenticity were common motivators (quotes 5–7). Others cited prior complications, keloid formation, pain avoidance, and a desire for quick return to activity. Some patients never felt connected to their breasts or preferred a smaller chest (quotes 8–10). A few had no choice due to complications from prior breast reconstruction, body dimensions, or aggressive cancers.

**Theme 7: financial and insurance considerations**

Finances influenced decision making for some, particularly pertaining to out-of-pocket costs and insurance coverage (quotes 1,2). Patients who had met their deductibles were motivated to avoid further surgeries, while others found navigating insurance coverage unclear and burdensome (quotes 3,4).

**Theme 8: body image and aesthetics**

Most patients expressed happiness with their decision (quotes 1–4), feelings of strength, empowerment, and retained femininity (quotes 5–8). Patients reflected that choosing to go flat required confidence and self-advocacy, and many did not associate their identity with their breasts (quotes 9–11).

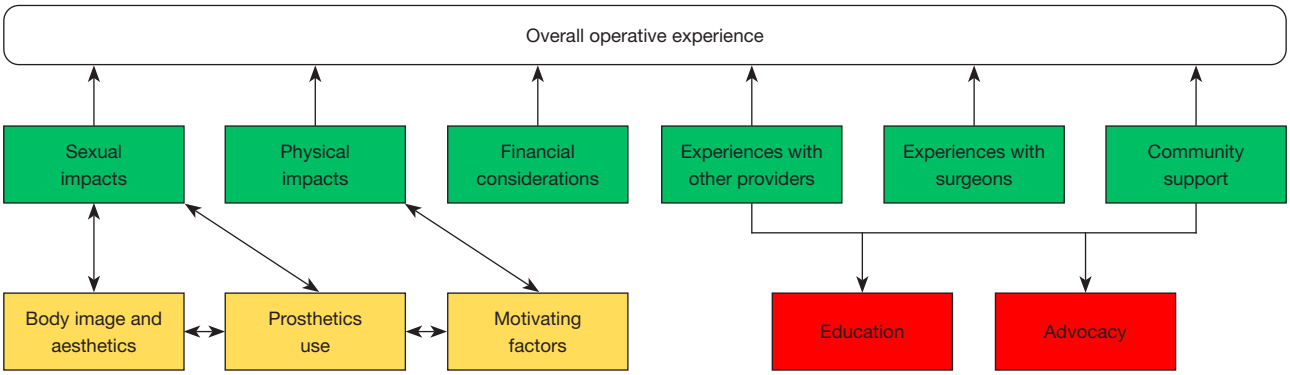


**Figure 1** Interactions between the 11 themes and their impact on the overall operative experience for patients.

In contrast, others initially struggled with body image, felt incomplete, or received negative public attention (quote 12). Many shared the need for new wardrobes (quotes 13,14). Some reported negative cosmetic results, lamenting prominent sternums, visible keloids, concave chests, and accentuated torsos. Some felt stigmatized for visible scars, while others viewed them as empowering symbols of survivorship (quote 15). The longitudinal nature of these feelings was dependent on each patient, with a majority becoming more comfortable with their new bodies over time, while others still struggle to adjust their wardrobes and acclimate to their bodies.

**Theme 9: prosthetics use**

Patients had mixed opinions about prosthetic use: some wear them consistently, others occasionally, and many not at all. Motivations included a desire to appear "normal", fear of judgement, and feelings of embarrassment when in public without breasts (quotes 1–3). Some viewed prosthetics as optional accessories, influenced by clothing or events. Barriers included lack of access, lack of education, physical discomfort, public challenges, and amplifying symptoms of iron bra syndrome (quotes 4,5).

**Theme 10: physical impacts**

Many patients felt they experienced faster recovery and return to activity than complex reconstruction patients (quotes 1–3). Some found physical activity more enjoyable post-operatively (quotes 4,5). Others experienced pain from radiation scarring, fibroids, numbness, weakness, or fatigue (quotes 6,7). Physical changes such as cording, postural changes, and phantom sensations were also reported (quote 8). Iron bra syndrome was a unique impact of flat closure, commonly described as chest tightness or discomfort despite being flat (quote 9).

**Theme 11: sexual impacts**

Some patients found returning to intimacy difficult, citing fears of rejection, diminished sense of attractiveness, lowered libido, and hormonal side effects (quotes 1–4). Flat closure also negatively impacted physical sensations during sexual intimacy (quote 5).

### *Conceptual model*

It is critical to note that these 11 themes do not exist in isolation; rather, they have complex interactions with one another and on the overall patient operative experience. As such, we derived a conceptual model through researcher interpretation of the themes to capture these interactions (*Figure 1*). We drew relationships between themes through analyzing direct quotes from patients' interviews. Themes exerting the most direct influence on the overall operative experience are depicted in green and include: experiences with surgeons, experiences with other providers, community support, financial and insurance considerations, physical impacts, and sexual impacts. Secondary themes, depicted in yellow, affect the operative experience indirectly by shaping these primary domains. Within this group, motivating factors encompass both prosthetics use and physical impacts, while body image and aesthetics, prosthetics use, and sexual health demonstrate bidirectional relationships with one another. Patient education and decisions to engage in advocacy are separate from the direct impact on perioperative experiences and are rather derived from experiences with surgeons, other providers, and community

support (highlighted in red). This model clarifies how themes are interconnected, allowing physicians and patients to better understand which factors may directly impact decision making.

### *BREAST-Q feedback analysis*

Participants offered suggestions to revise and expand the BREAST-Q to better reflect the experiences of flat closure patients. Key elements absent from the PROM included assessment of ability to fulfill familial duties, community support, pre-operative relationship to the chest, sources of reconstructive information, and prosthetic use. Participants also noted inconsistent verb tense and suggested that the use of present tense would be more appropriate, as the past tense assumes a patient's experience has concluded. Furthermore, the use of non-inclusive language, especially the repeated use of "women" and "breasts", excludes gender-diverse individuals. Specific feedback on each module follows.

**Module 1: psychosocial well-being**

This section was perceived as biased towards reconstruction as the superior option, using language like "normal" and "of equal worth to other women" (items D and H). Participants recommended inclusive phrasing, such as feeling "comfortable" versus "feminine" in your clothes, as femininity is neither the goal nor a priority for all patients. Additional suggestions included assessment of perceived judgement in social and professional settings, self-acceptance, prosthetic use, and "not applicable" as an answer choice. Participants also shared that, overall, this section felt emotionally triggering.

**Module 2: sexual well-being**

Patients shared that the module appears to assume that sexuality is tied to breasts and doesn't acknowledge that many other factors, such as chemotherapy or radiation, play a larger role on sexual well-being. Patients felt the module was incomplete as it lacked content on dating, breastfeeding, prosthetic use, and sexual self-image. A "not applicable" option and repositioning the module later in the survey were suggested due to the sensitive nature of the questions.

**Module 3: cancer worry**

Patients emphasized that fear of recurrence is ongoing and recommended adding survivor guilt and concern for loved ones.

**Module 4: fatigue**

The time frame, "past week", was seen as too narrow in the context of fatigue, which has both a short-term and prolonged course. Suggestions included assessing long-term and emotional fatigue, daily functioning, and sleep issues.

**Module 5: impact on work**

Patients advocated for a broader definition of work to include caregiving and homemaking. Emotional aspects of returning to work were also missing. They proposed adding items about decision to cease work, changes in workplace relationships, appearance concerns, and a "not applicable" option.

**Module 6: physical well-being: chest**

Participants shared that physical symptoms are not limited to the chest, but often extend down the torso, to the arms, and across the back. Common post-operative symptoms that are not captured in this module include numbness, tightness beyond the chest area, cording, itchiness, neurogenic pain, lymphedema, phantom pains, scarring, erythema, range of motion limitations, effects on sleep, and iron bra syndrome. Finally, patients felt the module needs to be consistent in using the language of 'chest' over 'breast'.

**Module 7: satisfaction with breasts**

Patients felt this section lacked comparison with a pre-operative baseline, assuming positive prior experiences and negative post-mastectomy experiences. They recommended including clothing adaptation, prosthetic use, and appearance-related changes. They also provided feedback on item C, "Being able to wear clothing that is more fitted?" suggesting a change to "Being able to wear clothing that you want?" since not all patients prefer fitted clothing. Further, item B, "How comfortably your bras fit?" may not be applicable depending on the patient and therefore suggested a not applicable option. Participants suggested renaming the module to either 'satisfaction with chest' or 'satisfaction with silhouette' to promote inclusivity.

**Module 8: adverse effects of radiation**

Suggested additions to this module included assessment of radiation effects on muscle, bone, skin (pigmentation and thinning), nerve damage, scarring, and experiences with

radiation oncology. A not applicable option is needed.

**Module 9: satisfaction with surgeon**

Patients found it unclear which surgeon was referenced. They proposed distinguishing between surgical roles and adding questions, such as "If surgeons engaged in a full discussion of all reconstructive options and risks?", "If an individualized treatment plan was provided?", "If consistent information was provided?", "If surgeons were supportive of patient decisions?", and "If post-operative resources were provided?".

**Modules 10 and 11: satisfaction with medical team and office staff**

Similar to module 9, patients also felt it was unclear which medical team was being referenced. Patients reported having different experiences with both medical, nursing, and office teams. They suggested adding questions about providers' knowledge, empathy, availability, and communication clarity.

## Discussion

This qualitative study sought to understand the experiences of patients who chose to undergo flat closure following their mastectomies. Given the lack of information related to flat closure and the state of stigma surrounding the experience, this project aids in demystifying the patient experience through one of the largest qualitative studies on the topic to date, educating providers on the merits of this reconstructive option, and identifying direct feedback on the inclusivity of the BREAST-Q.

### *Perioperative experiences*

Thematic analysis of 18 semi-structured flat closure patient interviews related to their perioperative experiences following mastectomy revealed 11 key themes: experiences with surgeons, experiences with other providers, education, community support, advocacy, motivating factors, financial and insurance considerations, body image and aesthetics, prosthetics use, physical impacts, and sexual impacts. Our findings align with current literature where participants describe facing pressure to undergo breast reconstruction, a lack of information related to flat closure, and overall high post-operative satisfaction after flat closure (7,8,13-15,21,22).

Beyond these findings, we identified that, similar to surgeons, staff knowledge of flat closure has a significant impact on the patient experience. Multiple patients reported never being presented with flat closure as an option following mastectomy, suggesting a lack of awareness or knowledge, leading to patients needing to self-educate and then self-advocate for what they wanted. Patients felt they were not given adequate resources related to all their reconstructive options, nor resources related to healing and physical therapy. Overall, patients valued empathy, thoroughness, and those who acted as advocates. These surgeons didn't push back on patients' decisions, communicated effectively, and left patients feeling fully supported. Our findings suggest that communication and education on flat closure needs to be improved across teams to provide more empathetic and accurate perioperative care to patients.

Due to the lack of understanding from their support systems, patients who chose flat closure sought out information, connection, and empowerment from online flat closure communities. Seeing photos of other women's flat closures significantly impacted decision-making, providing patients with a clearer understanding of possible outcomes. Community interactions acted as corrective emotional experiences, turning trauma from surgery and cancer treatment into interpersonal connection and community. Patients recommend providers refer their flat closure patients to the Facebook groups.

Motivating factors for the decision to go flat were multifactorial, though faster recovery, avoidance of complications, and foreign bodies were predominant concerns, concurring with current literature (7). Many expressed that their femininity and gender identity were not tied to their breasts. Some patients did report that financial and insurance coverage impacted their reconstructive decision making, but for a majority, this was not a concern.

Most patients were satisfied with their surgical outcomes and expressed that they felt confident and feminine afterwards. These participants did not attribute their breasts to their sense of self nor their gender identity, and often found strength and satisfaction in their post-operative flat appearance despite needing to adjust their wardrobes and styles. However, due to societal expectations of femininity, some participants did feel a need to wear prosthetics when in public and shared feeling embarrassed to be seen without them. Finally, following flat closure,

some patients found return to intimacy difficult due to perceptions of attractiveness and physical impacts of treatment.

### *BREAST-Q feedback*

Feedback pertaining to the BREAST-Q survey elucidated that the questionnaire appears to have a bias in language and content towards those who undergo breast reconstruction. Language such as "breast", "women", "normal", and questions related to bras, sexuality, and femininity, left flat closure patients disappointed with the quality and accuracy of the survey. Suggestions centered around altering language to be more consistent and inclusive, and adding not applicable options to multiple modules. Of note, the Gender-Q is available to assess the perioperative experiences of gender diverse patients; however, the motivations for patients undergoing gender affirming surgery vary from those undergoing oncologic flat closure. Suggesting the survey would be unable to accurately capture the experiences of oncologic patients. To better elucidate satisfaction with surgeons and staff, patients suggested interrogating whether medical teams were educated on all reconstructive options and if they supported patient decisions.

### *Limitations*

This study is not without limitations. Inherent to the design of a semi-structured interview asking patients to reflect on their past experiences, recall bias may be present in this participant pool. Despite efforts to enroll diverse patients, we interviewed a sample of majority White and highly educated participants. Using a purposive sampling strategy may lead to survey response bias impacting our sampling and results, as non-responders may have differing experiences with flat closure. In particular, the fact that some participants identified as flat closure advocates likely impacted the extraction of the education and advocacy themes. Further, there is no way to know if the experiences of underserved populations differ from our sample. For example, a majority of our cohort was recruited via Facebook, implying that national participants had to have some degree of social media literacy in order to participate. Overall, participant demographics and sampling method may limit generalization of our results. We hypothesize that this may be because flat closure is not often presented as an option to all mastectomy patients, and thus a significant amount of technological and healthcare literacy is required to edify oneself on flat closure. A strength of our cohort is the geographic diversity we were able to accomplish through online recruitment methods. This suggests that the themes we discovered are not isolated to patients at our institution but are applicable to the demographic we surveyed nationwide.

## Conclusions

Our results reveal patient experiences exist on a spectrum for any reconstructive option, and therefore flat closure should be presented as an option with benefits and drawbacks similar to implant-based and reconstruction. Further, staff needs to ensure that language is consistent and inclusive as it can have significant impacts on patient quality of life. Community was the most potent theme throughout all the interviews. Providers should empower patients to seek outside resources to better understand the experiences of flat closure patients. Finally, due to the reconstructive bias present in the BREAST-Q, our findings suggest a need for the addition of a flat closure adjunct to capture the experiences of this unique community.

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## Footnote

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*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki and its subsequent amendments. This study was approved by the University of California, San Francisco Institutional Review Board (No. 19-29615) and informed consent was obtained from all individual participants.



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## Supplementary

**Table S1** BREAST-Q feedback applicable to all breast surgery patients

| Module | Suggested additions | General constructive feedback |
|---|---|---|
| Overall BREAST-Q | Ability to fulfill familial duties | Inconsistent tense, present tense would be more appropriate than past tense |
| | Assessment of community support | Lack of clarity about purpose of survey |
| | Fear during cancer management | Repeated language of “women” and “breasts” is not inclusive |
| | Pre-op relationship to breasts/chest | |
| | Sources of information/education | |
| | Scarring/keloids | |
| | Decision-making | |
| | Assessment of need for additional therapy/PT support | |
| | Prosthetic use | |
| | Surgical revision history | |
| Module 1: psychosocial well-being | Judgement in social settings | Psychosocial well-being is not exclusive to breasts |
| | Judgement in professional settings | Gender identity is not always tied to breasts |
| | Support systems | Language is not inclusive |
| | Not applicable option | Timeframe is unclear |
| | Accepting of new self | Doesn’t capture intended experiences |
| | Comfort in body | Section assumes what a “normal” female body is. Questions ‘of equal worth to other women’ and ‘normal’ are inappropriate and trigger uncomfortable emotions |
| | Prosthetics use | Change wording from “feminine” to “comfortable” as femininity is not the goal for all |
| | | Questions are worded in a way that shows bias towards patients who underwent reconstruction |
| Module 2: sexual well-being | Dating experiences | Question order is not intuitive |
| | Desirability | Module is not holistic |
| | Stimulation | Assumes sexuality is tied to breasts. Many other factors play a larger role |
| | Willingness to initiate | Is not inclusive of all sexualities |
| | Breastfeeding | Should come near the end of the survey as it contains sensitive/triggering content |
| | Not applicable option | |
| | Pain during intercourse | |
| | Baseline assessment of sexual engagement | |
| | Impact of prosthetics on sexual activity | |

**Table S1** (*continued*)


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**Table S1** (*continued*)

| Module | Suggested additions | General constructive feedback |
|---|---|---|
| Module 3: cancer worry | Recurrence | Cancer worry never ceases thus this module does not feel productive to patients |
| | Survivor guilt | Emotionally charged and difficult to read |
| | Impact on loved ones | Questions should be reframed to reflect totality of cancer treatment |
| | Complications | Question 25 should be reframed from daily activities to quality of life |
| | Management of worry | |
| Module 4: fatigue | Ability to do activities of daily living | Nonspecific |
| | Sleep changes | Fails to capture longitudinal experience as fatigue is two pronged: post-surgical and long term |
| | | Does not capture emotional fatigue |
| | | Mood is not an appropriate word to use in this module as it doesn't capture the intended experience |
| | | Bandwidth is better phrasing than social life |
| | | Negative valence assumes experience |
| Module 5: impact on work | Cessation of work | Needs expanded definition of work to include obligations such as taking care of kids, running a home, etc. |
| | Impact on coworker relationships | Lacks an assessment of the emotional aspect of returning to work, solely focusing on the practical |
| | Physical appearance at work | Questions are redundant |
| | Not applicable option | Module is vague about time frame of impact on work |
| | Filed for accommodations/disability | |
| | Comfortable discussing health with supervisors | |
| Module 6: physical well-being: chest | Common post-operative symptoms: numbness, tightness beyond breast/chest area, cording, itchiness, neurogenic pain, lymphedema, phantom pains, diverting, scarring, erythema, range of motion limitations | Negative valence assumes experience |
| | Experience of post-operative complications | Doesn't capture longitudinal experience |
| | Iron bra syndrome | Symptoms are not limited to the chest and often extending to torso and back |
| | Effects on sleep (side sleeping, stomach, pain, pulling) | Module needs to be consistent in language use of chest over breast |
| | Required PT | Ambivalent about the use of "aesthetic" flat closure, as not all patients find it applicable to their experience |

**Table S1** (*continued*)


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**Table S1** (*continued*)

| Module | Suggested additions | General constructive feedback |
|---|---|---|
| Module 7: satisfaction with breasts | Prosthetics | Adjust to "Being able to wear clothing that you want?" since not all prefer fitted clothing |
| | Satisfaction with final result | Bra question may/may not be applicable depending on patient |
| | Needed new clothing/bathing suits/bras | Change language to "chest" or "silhouette" |
| | Needs a "not applicable" option | Fails to capture emotional impact |
| | | No assessment of baseline happiness with appearance. Assumes positive prior experience and current negative experience |
| Module 8: adverse effects of radiation | Expand questions to include effects on muscle, bone, skin pigmentation, skin thinning, nerve damage, scarring, long term effects of radiation | Counseling was not sufficient to prepare patients |
| | Experience with radiation oncology | Radiation section not applicable for those undergoing prophylactic surgery |
| | Education on radiation | |
| | Not applicable option | |
| Module 9: satisfaction with surgeon | Reconstructive options and risks discussed | Questions require differentiation between breast and plastic surgeon |
| | Radiation risks discussed | Clarify time frame of satisfaction with surgeon, over several months or several years |
| | Effective/sufficient communication | |
| | Individualized treatment plans | |
| | Provided consistent information | |
| | Was surgeon supportive of your decision | |
| | Provided post-op resources | |
| Modules 10 and 11: satisfaction with medical team and office staff | Availability for follow-up | Unclear which team is referenced (differences exist between medical, nursing, and office teams) |
| | Did you experience empathy | Staff need to be knowledgeable |
| | Effective/clear communication | |

PT, physical therapy.


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