

Perception of Breast Reconstruction among 10,299 Indian Women

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Background: Less than 1% of women undergo breast reconstruction after mastectomy in India. To understand if the perception of breast reconstruction among Indian women is a contributing factor, a survey of 10,299 women was done.

Method: In total, 10,299 women answered questions from a questionnaire with the help of social workers (10,005) and using the SurveyMonkey App (294).

Results: An estimated 48.8% of women were aware of breast reconstruction. Around 77.5% felt that women would feel depressed after mastectomy, and 76.5% said they would prefer breast reconstruction. Irrespective of age and financial status, most women preferred breast reconstruction after mastectomy. Autologous reconstruction (79.6%) was preferred to implant reconstruction (20.4%). An estimated 71.3% liked the idea of a DIEP flap. When explained that DIEP flap may take 6–8 hours of surgery and cost about US \$3500, only 48.8% would go for a DIEP flap. For early breast cancers, women preferred breast conservation surgery (65.7%) to mastectomy and breast reconstruction (34.3%). Women felt that the best way to increase awareness of breast reconstruction would be by social media (47.8%) followed by word of mouth (16.4%), television (13.4%), newspapers (11.7%), and magazines (10.6%).

Conclusions: Although the breast reconstruction rates are very low, women preferred breast reconstruction to mastectomy alone regardless of age and financial status. The surgical teams should devise strategies to assure woman that they can achieve reliable reconstruction at an affordable cost. Increasing experience and reduction of operation time would make autologous breast reconstruction affordable. This strategy could apply to most developing economies. (*Plast Reconstr Surg Glob Open* 2021;9:e3517; doi: [10.1097/GOX.0000000000003517](https://doi.org/10.1097/GOX.0000000000003517); Published online 15 April 2021.)

INTRODUCTION

Breast cancer is the most common cancer among Indian women.¹ The incidence of breast cancer in India is increasing, as evidenced by the increase in age-standardized incidence rate by 39% between 1990 and 2016.² Chopra et al have reported an earlier occurrence of breast cancer in Indian women (Median age: 49 years) compared with American women (Median age: 62 years).³ As part of breast cancer treatment, mastectomy

can result in many psychosocial issues, poor mental health, anxiety, stress, and loneliness.^{4,5} It is also known that breast reconstruction after mastectomy helps reduce most of the above problems.^{6–8} Hence, the Association of Breast Surgeons of India has strongly recommended immediate breast reconstruction, if possible.⁹ Although multiple studies have shown the advantages of breast reconstruction, the percentage of breasts reconstructed after mastectomy remains <1% in India.¹⁰ The surgical community presumes that the low percentage of reconstruction is probably related to women's cultural and social perception of breast reconstruction. We wanted to know if that perception was correct and also to know the extent of awareness of the possibility of breast reconstruction in a developing country like India. We surveyed 10,299 women to assess their perception of breast

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reconstruction to help evolve a strategy to increase the breast reconstruction rate after mastectomy. This probably will be the first such study done with large numbers in a developing country like India.

MATERIALS AND METHODS

Of the 11,826 women who were requested to participate in the survey 10,299 women kindly consented to answer our queries. We prepared a questionnaire regarding breast reconstruction and sent it to women by Facebook and WhatsApp through the SurveyMonkey App. Through this method, 294 of 586 women to whom the questionnaire was sent answered the questions. (See appendix, Supplemental Digital Content 1, which displays a survey regarding breast reconstruction after breast cancer. <http://links.lww.com/PRSGO/B616>.) We got experienced and trained social workers who went to the community and requested 11,240 women to participate in the survey. The social workers asked the questions shown in the Supplemental Digital Content 1 to 10,005 women, in their local language. Of the 10,005 women, 8960 women belonged to the state of Tamil Nadu (who speak Tamil) and 1045 women belonged to the state Kerala (who speak Malayalam). An estimated 27.5% of women did not want to reveal their age, and 3.4% of women preferred not to disclose their income. Most of the other questions were answered (98.1%–99.7%). The answers from 10,299 women were then transferred to an Excel spreadsheet (Microsoft Excel, Microsoft Corp, Redmond, Wash.) and analyzed using R software (version 3.5.2).

RESULTS

We analyzed the responses to the breast reconstruction questionnaire of 10,299 women. The distribution of the respondents based on the age and income of family is shown in Tables 1 and 2. In total, 48.8% of women were aware of breast reconstruction, whereas 51.2% of women were not aware that breasts could be reconstructed. The

Table 1. Distribution of the Respondents' Age Group

Age	No. Women	%
<29	4729	45.9
30–39	993	9.6
40–49	1058	10.3
50–59	522	5.1
>60	163	1.6
Would not reveal the age	2834	27.5
Total	10,299	100

Table 2. Distribution of the Respondents' Family Income in a Month

Monthly Family Income	No. Women	%
<20,000 rupees (\$274)	6519	63.3
20,000–50,000 rupees (\$274–\$685)	2161	21
50,000–100,000 rupees (\$685–\$1370)	825	8
>100,000 rupees (\$1370)	441	4.3
Would not reveal income	353	3.4
Total	10,299	100

relationship of women preferring breast reconstruction according to their age and the amount of money the family earned is given in Tables 3 and 4. The survey showed that 77.5% of women felt that women would be depressed after mastectomy and 76.5% of women would like to get their breasts reconstructed after mastectomy. After explaining what the deep inferior epigastric artery perforator (DIEP) flap meant, 71.3% of women felt that it was acceptable. When explained further that the surgery would cost 2.5 lakh rupees (around US \$3500) and 6 to 8 hours of surgery, only 48.8% of women felt that they would go for DIEP flap reconstruction. On probing further among the 51.2% of women who were not comfortable with the idea of having a DIEP flap after knowing the cost of the procedure, 37.2% of women felt that it was too long, 9.2% thought that it was expensive, 49.4% thought that it was too long and too expensive, and 4.2% cited other causes such as fear of a long surgical procedure and doubts whether a good reconstruction could be done. A majority of women favored autologous reconstruction (79.6%) compared with implant reconstruction (20.4%). An estimated 47.6% of women preferred immediate reconstruction compared with 52.4% who wanted delayed reconstruction. For early breast cancers with no nodal spread, 65.7% of women chose breast conservative surgery while 35.7% of women desired mastectomy with breast reconstruction. Women felt that the best way to increase the awareness of breast reconstruction would be by social media (47.8%), word of mouth (16.4%), television (13.4%), newspapers (11.7%), and magazines (10.6%).

DISCUSSION

Breast reconstruction helps restore body image, sexual life, and psychosocial image, and increases women's confidence. Hence, breast reconstruction has become an integral part of the interdisciplinary management of breast cancer in developed nations. In our current study, 77.5% of women felt that women would get depressed after a mastectomy, and 76.5% of women felt that breast

Table 3. Comparison between the Age Groups and the Desire for Breast Reconstruction

Age Group	For Reconstruction (in %)	Not for Reconstruction (in %)
<30	73	27
31–40	96	4
41–50	94	6
51–60	94	6
>60	88	12

Table 4. Comparison between Family Income and the Desire for Breast Reconstruction

Family Income in a Month	For Reconstruction (in %)	Not for Reconstruction (in %)
<20,000 rupees (\$274)	79	21
20,000–50,000 rupees (\$274–\$685)	73	27
50,000–100,000 rupees (\$685–\$1370)	71	29
>100,000 rupees (\$1370)	80	20

Table 5. Reasons for Low Breast Reconstruction Levels and Potential Strategies to Increase the Rates

Reasons for Low Breast Reconstruction Levels	Potential Strategies to Increase the Rates
Low awareness of breast reconstruction among the public	Increase awareness by social media, word of mouth, television, and print media
Misconception that Indian women do not desire breast reconstruction and that it is a procedure for the rich and young women	Spread the message that Indian women desire breast reconstruction regardless of age and income
Unaffordable	Reduce wastage, increase efficiency, increase health insurance coverage, and reduce costs
Long operation	Build a team, increase the efficiency of the team, do breast reconstruction often, parallel operating, and reduce the nonoperating time in the theater
Poor infrastructure	Increase the number of operation theaters and hospitals specializing in breast reconstruction; train more surgeons, nurses, and other nonmedical staff in breast reconstruction

reconstruction would help relieve this depression. This indicates that most women in India recognize depression after mastectomy and would like to have breast reconstruction after mastectomy. The monthly household income of most (63.3%) respondents was <Rs 20,000 (US \$274). The annual per capita income of India during the period 2018–2019 was 135,048 rupees/US \$1850 (11,254 rupees/US \$154 per month), and these data would help to put the study population in perspective.¹¹ As shown in Tables 3 and 4, irrespective of the age and the amount earned by the family, women desire breast reconstruction after a mastectomy and it should be offered to all women regardless of age and income status. Despite this, the breast reconstruction rate is <1%. The reasons for this and the potential strategies to overcome this are given in Table 5.

With breast reconstruction being desirable but not essential, breast reconstruction rates could improve with increased awareness of the advantages of breast reconstruction among the public.¹² We need to get the trust of the women in convincing them that the procedure is reliable. This is reflected in the steady increase in breast reconstruction rates in the USA compared with the 1980s secondary to increased awareness.^{13–15} Understanding how to effectively spread breast reconstruction awareness is essential for proper planning of the breast reconstruction campaign. In tune with the modern age, most women considered social media (47.8%) the best method to raise breast reconstruction awareness, followed by the traditional word of mouth, television, and the print media. Awareness campaigns by different media seem to be the reason why there is increased awareness of breast reconstruction in our study (48.8%) compared with Kothari et

al's observations in 2012 (24.2%).¹⁶ However, we need to do a lot more to increase awareness.

Most women preferred autologous reconstruction (79.6%) compared with implant reconstruction (29.4%). Leong et al have reported high levels of Indian patients presenting at Stage 2 (23%–58%) and Stage 3 (29%–52%) disease.¹⁷ With most patients presenting with advanced disease, radiotherapy needs to be given to most women. In irradiated patients, Chetta et al have reported high levels of failure of reconstruction in implant reconstruction (29.4%) when compared with autologous reconstruction (4.3%).¹⁸ For Indian patients, autologous reconstruction would be safer in this regard. Autologous reconstruction has been associated with higher satisfaction levels and psychosocial and sexual well-being than implant reconstruction.^{19,20}

The DIEP flap is considered the gold standard form of autologous breast reconstruction because it provides considerable skin and fat, good perforators, and has a favorable donor site.^{21–23} The idea of the DIEP flap appealed to 71.3% of women. When explained that the DIEP flap would take around 6–8 hours of operation and cost about 2.5 lakh rupees (around US \$3500), only 48.8% felt that the DIEP flap would be acceptable. Among those who did not feel that the DIEP flap was suitable for the procedure, cost, and surgical time, 37.2% thought it was too long, 9.2% felt that it was expensive, and 49.4% felt that it was both too long and expensive. This shows that to make the DIEP flap more acceptable, it is essential that the procedure is done quickly and reliably. Various studies have shown that when the DIEP flap procedure is broken down into multiple parts, and when each part is done consistently and reliably by a team, the DIEP flap could be made much quicker. The surgical timing could be reduced by repeated effort with volume, using imaging to map the perforators, parallel operating and reducing the nonoperating timing while preparing and shifting the patient.^{24–27} Steps should be taken to reduce the operation room time to make it more acceptable and affordable.

The Indian government spends less on healthcare (1.6% of GDP) than developed nations like the United States of America (17.7% of GDP).^{28,29} The government hospitals cater to 33% ailments in rural areas and 26% ailments in urban areas. The rest of the diseases are treated by private hospitals and clinics. Between 2017 and 2018, only 14% of the rural population and 19% of the urban population had health insurance coverage. Of this, 13% of the rural population and 9% of the urban population were covered by government-supported health insurance schemes.³⁰ In September 2018, the government of India launched the *Pradhan Mantri Jan Arogya Yojana (PM-JAY) Ayushman Bharat scheme*, which is a government-sponsored health insurance scheme offering free specialist care of worth 500,000 rupees (US \$6821) to 500 million people who form the bottom 40% of the Indian population.³¹ Most of the population depends on the out of pocket expenses for treating their health problems, including breast cancer, breast reconstruction and the complications if they arise. Hence, the cost factor does play a significant role in the decision to undergo breast reconstruction in 58.6% of women as shown in our

study. The breast reconstruction rates could improve if the cost of breast reconstruction is brought down by avoiding wastage, efficient usage of theater time, and by enrolling more people under health insurance.

Immediate breast reconstruction is widely accepted because it involves only 1 procedure and may give better aesthetic results than delayed reconstruction when associated with skin-sparing or nipple-sparing mastectomy.^{32–35} Various studies have shown comparable outcomes with immediate and delayed reconstruction.^{34,35} In our study, women have almost equally chosen immediate reconstruction (47.6%) when compared with delayed reconstruction (52.4%).

In early breast cancer, various studies have noted that breast conservation surgery (BCS) has comparable oncologic and aesthetic outcomes compared with mastectomy and reconstruction.^{36–38} BCS involves removing the breast lump with a margin and following it up with radiotherapy once the wound heals. Hence, a choice can be given to a patient with early breast cancer. The BCS procedure can be associated with positive margins. Jeevan et al has reported that 1 in 5 patients undergoing BCS needed reoperation because it was associated with positive margins.³⁹ The reoperation rates were higher when associated with carcinoma in situ and multifocal diseases. In early cases with favorable pathology and node-negative axilla, mastectomy and reconstruction need not be followed up with radiotherapy. However, the procedure is longer, and can be associated with donor site morbidities and microsurgical failure.⁴⁰ Most women preferred BCS (65.7%) compared with mastectomy and breast reconstruction (34.3%) because they felt that BCS would be a much simpler operation compared with mastectomy and reconstruction.

This study's strength is that it has taken into consideration the views of 10,299 women across different ages and social strata regarding breast reconstruction. We believe that this study would help the authorities increase breast reconstruction awareness among people and improve the facilities for breast reconstruction in various plastic surgical units in India and in the developing world.

This study's limitation is that it does not consider views of patients prospectively diagnosed with breast cancer regarding breast reconstruction. Post-diagnosis, the decisions regarding reconstruction could change due to various social and financial reasons. This study's other limitations include limited demographic data restricted to women among 2 states in India, the self-selection bias of those who fill in the questionnaire, and evaluating women based on the income of family than educational status and an unvalidated study. If the various social and economic factors could be taken care of, breast reconstruction rates would vastly improve, as evidenced by the strong desire to undergo breast reconstruction among women in this study.

CONCLUSIONS

The study aimed to understand why breast reconstruction was performed in <1% of mastectomies in India. This study shows that regardless of age and financial status, most

women prefer breast reconstruction after mastectomy. Culturally, the Indian women appear to be no different from the Western women in their wish for breast reconstruction after mastectomy. After the mastectomy, breast reconstruction rates would improve if Indian women could be provided with reliable reconstruction options, which the majority could afford and could be completed in a “not too long” surgical procedure. Because most Indian women had also preferred autologous reconstruction, the surgical teams must follow strategies to reduce the operative timing and cost of care. With a better understanding of Indian women's preferences, we hope that this article can increase breast reconstruction rates in India and the developing world, thus benefitting our patients.

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