

# Decision Regret in Plastic Surgery: A Summary

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**Background:** Patient decision regret can occur following elective healthcare decisions. The current era is focused on patient-reported outcomes, and decision regret is another metric by which surgeons can and should measure postoperative results. Patients who experience decision regret after elective procedures can often blame themselves, the surgeon, or the clinical practice, and this can lead to downstream psychological and economic consequences for all parties involved.

**Methods:** A literature search was conducted on PubMed using the following search terms: (aesthetic surgery) AND (decision regret), (rhinoplasty) AND (decision regret), (face-lift) AND (decision regret), (abdominoplasty) AND (decision regret), (breast augmentation) AND (decision regret), (breast reconstruction) AND (decision regret), (FACE-Q) AND (rhinoplasty), (BREAST-Q) AND (breast augmentation). The following article types were included in the search: randomized controlled trials, meta-analysis, and systematic reviews.

**Results:** After review of the literature, preoperative education, decisional tools, and postoperative complications were found to be the most important factors affecting decision regret after surgery.

**Conclusions:** A better understanding of the factors associated with decision regret can help surgeons provide more effective preoperative counseling and prevent postoperative decision regret. Plastic surgeons can use these tools within a context of shared decision-making and ultimately increase patient satisfaction. Decision regret for plastic surgical procedures was mainly in the context of breast reconstruction. The differences in medical necessity create unique psychological challenges, emphasizing the need for more studies and a better understanding of the topic for other elective and cosmetic surgery procedures. (*Plast Reconstr Surg Glob Open* 2023; 11:e5098; doi: 10.1097/GOX.0000000000005098; Published online 27 June 2023.)

## INTRODUCTION

Decision regret is defined as “distress or remorse after a healthcare decision.” Compared with medically necessary healthcare decisions (which are still not immune from decision regret), elective healthcare decisions are especially vulnerable to retrospective review and decision regret from patients and surgeons alike. Decision regret has become a common metric in patient-reported outcome studies within the hand surgery literature.<sup>1</sup> Within plastic surgery, there exists a wide fund of literature on

decision regret following breast reconstruction and gender-reaffirming procedures.<sup>2,3</sup> Multiple studies also exist that investigate postoperative satisfaction, sexual well-being, and psychosocial well-being after cosmetic procedures using tools, such as the five-point Likert scale and the BREAST-Q, and FACE-Q questionnaires. However, decision regret is not directly analyzed within the above-mentioned tools.<sup>4,5</sup> Decision regret has been self-reported by many patients.<sup>6,7</sup> A UK research poll revealed that 60% of quizzed participants regretted having aesthetic surgery and unmet expectations were the most common reason.<sup>8</sup> However, formal literature is lacking on decision regret in aesthetic procedures, defined as “procedures that are done to improve the appearance of the face and body.”<sup>9</sup> Such procedures include breast augmentation, face-lift, rhinoplasty, and abdominoplasty. It is important to investigate decision regret as it pertains solely to aesthetic procedures because the exclusion of medical necessity creates the possibility for unique psychological challenges both pre- and postoperatively. The experience of decision regret can have adverse psychological effects on the patient and can harm the relationship between the patient and the surgeon. The purpose of this review is to

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**Table 1. Summary of Research**

Reference	Year	ss	Main Findings
Zhong et al <sup>13</sup>	2013	10	Decision regret was greater in patients less satisfied with preoperative information by their surgeon (beta = 0.95; 95% CI, 0.93–0.96), and greater satisfaction was reported in patients with higher self-efficacy (beta = 1.06; 95% CI, 1.04–1.09).
Cai and Momeni <sup>14</sup>	2021	63	The occurrence of postoperative complications was strongly and significantly correlated with higher decision regret scores ( $P = 0.004$ ), and reconstructive modality did not affect satisfaction or decision regret.
Shammas et al <sup>16</sup>	2022	131	Patients with a history of failed implant reconstruction had significantly lower BREAST-Q scores ( $P = 0.04$ ) and sexual well-being ( $P = 0.01$ ) with higher decision regret scores ( $P = 0.01$ ).
Zhong et al <sup>17</sup>	2013	181	Optimism had no significant effect on decision regret in White women, but a significant correlation was found between low optimism and decision regret in non-White women.
Luan et al <sup>18</sup>	2016	16	Patients who received the decision aid showed a trend toward decreased decisional conflict preoperatively and postoperative patients experienced less decision regret ( $P \leq 0.001$ ) with no change in QOL, anxiety, or depression.
Klifto et al <sup>19</sup>	2021	20	Decision aids did not significantly reduce preoperative DCS total scores compared to current educational materials.
Fortunato et al <sup>21</sup>	2019	328	Younger women had worse social and emotional functioning scores ( $P < 0.001$ ) independent of tumor stage and IBR led to improvement. Body image and sexual functioning scores improved with BR.
Deliere et al <sup>20</sup>	2021	1525	Decision regret scores were decreased in all surgical groups, but women who underwent a bilateral mastectomy had the lowest score ( $P = 0.001$ ).

BR, breast reduction; IBR, immediate breast reduction; QOL, quality of life.

analyze the existing research in breast reconstruction with the aim to improve the understanding of decision regret in the field of plastic surgery and identify effective tools to decrease its incidence after aesthetic procedures. See Table 1 for a concise summary of the articles discussed in this article.

## LITERATURE REVIEW AND DISCUSSION

### Preoperative Patient Education

It is often felt that preoperative patient education is important for any kind of surgical procedure in that it helps patients understand the various potential outcomes and lines up expectations. Breast reconstruction after a mastectomy, for example, has been shown to improve patients' quality of life by enhancing patient's sense of

### Takeaways

**Question:** What does the existing literature show regarding the incidence of decision regret in patients who undergo aesthetic procedures?

**Findings:** Most of the formal literature includes patients who have undergone postmastectomy breast reconstruction and gender-reaffirming procedures. In these areas, the main factors influencing the experience of decision regret were preoperative education and counseling as well as postoperative complications.

**Meaning:** More research on the experience of decision regret in elective aesthetic procedures is necessary to provide plastic surgeons with an understanding of the factors that impact decision regret so that patients can be better informed and supported.

self.<sup>10–12</sup> These psychological benefits may be reversed by decision regret postoperatively. Zhong et al<sup>13</sup> investigated whether patient empowerment preoperatively led to lower levels of decision regret and increased satisfaction postoperatively. In their cross-sectional study, they evaluated the relationship between self-efficacy, patient preoperative education, and patient satisfaction in the setting of breast reconstruction. A total of 100 patients completed a series of questionnaires, which included a Decision Regret Scale (DRS), the satisfaction subset of the BREAST-Q, and a Modified Stanford Self-Efficacy Scale. Zhong et al<sup>13</sup> found that regret was significantly reduced when participants were satisfied with the preoperative counseling they received from their plastic surgeon. Patients also reported a higher satisfaction when they had higher self-efficacy.<sup>13</sup> Similarly, patients with lower self-efficacy were at a higher risk of being dissatisfied with the information they receive preoperatively and as a result, have a higher risk of experiencing decision regret.<sup>13</sup> These results elucidate the importance of a shared-decision model in healthcare, which is especially the case in elective cosmetic procedures.

Cai and Momeni<sup>14</sup> also investigated the impact of preoperative patient education on postoperative decision regret. More specifically, they discussed how a foundation of knowledge can better equip patients to handle the consequences of surgical complications. In their study, they investigated the association between breast reconstruction modalities and the degree of postoperative decision regret. Participants who had undergone either implant-based or autologous breast reconstruction with a minimum 12-month follow-up were asked to complete the DRS and BREAST-Q Satisfaction with Breasts module. Neither satisfaction with breasts nor decision regret was impacted by the reconstructive modality.<sup>14</sup> However, the occurrence of postoperative complications was significantly correlated with higher decision regret scores but did not impact satisfaction with breasts.<sup>14</sup> These findings suggest preoperative discussions add to patient resilience—an attribute that plays an important role in the setting of postoperative complications. According to these studies done by Zhong et al<sup>13</sup> and Cai and Momeni,<sup>14</sup> enhanced preoperative education may decrease decision regret among patients seeking breast reconstruction.

### The Role of Postoperative Complications

Shammas et al<sup>15</sup> looked specifically at the effect postoperative complications have on decision regret. They assessed the influence of prior failed implant-based reconstruction on long-term patient-reported outcomes after free-flap breast reconstruction. Their analysis included all patients undergoing free-flap breast reconstruction over a 5-year period. Patients with and without a history of implant breast reconstruction completed the BREAST-Q and DRS. Following free flap reconstruction, patients with prior failed implant reconstruction had significantly lower BREAST-Q satisfaction scores and reported higher decision regret scores. As expected, this study demonstrates that complications increase the risk of decision regret. However, in these cases, the timing of free flap reconstruction may be a confounding variable. Thus, in a separate study using the BREAST-Q and DRS, Shammas et al<sup>16</sup> demonstrated that decision regret was not influenced by the timing of free-flap reconstruction, including immediate, delayed, and staged.

In stark contrast to these findings, an additional study done by Zhong et al<sup>17</sup> found no significant correlation between major postoperative complications and the experience of decision regret. In their study, Zhong examined the association between dispositional optimism, postoperative complications, and decision regret in patients undergoing microsurgical breast reconstruction. A total of 181 women were surveyed, and the results showed optimism had no significant effect on decision regret in White women. However, there was a significant correlation between low optimism and decision regret in non-White women with higher levels of mild and severe regret. These results may shine a light on possible cultural differences to be aware of during preoperative planning and the decision-making process. More research needs to be done to further understand these findings. The differing findings between the Zhong and Shammas studies may be due to their disparate populations. Shammas used a cohort who had experienced a prior failed implant-based reconstruction, whereas Zhong studied a cohort undergoing microsurgical breast reconstruction with no history of a failed procedure. Further research among similar study cohorts should be performed to obtain a better understanding of the influence postoperative complications have on decision regret in breast reconstruction.

### The Use of Decision Aids

With the aim to improve preoperative information and decrease the risk of decision regret, Luan et al<sup>18</sup> performed a prospective randomized controlled trial that analyzed whether a decision aid could foster decision support and structured guidance for prosthetic, autologous, and combined breast reconstruction surgery. The decision aid used was a novel aid that provided decision support and structured guidance on prosthetic, autologous, and combined autologous reconstructive surgery. A total of 16 patients were randomized to either receive the standard preoperative visit format or a preoperative visit using the novel decision aid. Before their new consultation visit, patients filled out a Decisional Conflict Scale (DCS) and BREAST-Q

Reconstruction Preoperative survey. Patients also completed a DRS, BREAST-Q Reconstruction Postoperative survey, and a Hospital Anxiety and Depression Scale 3–5 months postoperatively. Although a small sample size, the patients who received the decision aid exhibited a trend toward decreased decisional conflict postoperatively and significantly less decision regret. However, there was no significant difference in postoperative anxiety/depression between the two groups. These findings show that an appropriate decision aid can help patients make informed decisions regarding their values and preferences and may prevent decision regret, but the study is limited in power due to having a small sample size ( $n = 16$ ). Further research is needed to accurately assess the association between preoperative decision aids and postoperative decision regret.

In contrast, Klifto et al<sup>19</sup> found in their prospective randomized controlled study that decision aids did not significantly reduce decision conflict. Women with newly diagnosed breast cancer seeking reconstruction were prospectively randomized into one of two groups: standard education preoperatively versus standard education in addition to a decisional aid. The decisional aid used was in the form of an information brochure. Preconsultation and postconsultation DCS scores were acquired. No statistical significance was found between the two groups when the preconsultation DCS total scores were compared.<sup>19</sup> Since a postreconstruction DRS was not completed, we cannot infer whether decision regret would be experienced by these patients. Additionally, differences between the decision aids used by Luan et al and Klifto et al could have also led to their conflicting results.

### Breast Conservation versus Total Mastectomy

The study by Deliere et al<sup>20</sup> investigated whether the experience of decision regret was dictated by the oncologic resection. They surveyed 1525 Love Research Army volunteers who underwent breast cancer surgery between the years 2009 and 2020. Decision regret scores were compared across the following groups: those who underwent bilateral mastectomy, unilateral mastectomy, breast-conserving surgery, and breast-conserving surgery followed by mastectomy. Bilateral mastectomy was associated with significantly less decision regret than all other oncologic resections.

A recent study by Fortunato et al<sup>21</sup> surveyed patients who underwent mastectomy with or without breast reconstruction over a 10-year period. Their results of the 328 patients revealed that emotional and social functioning scores were significantly improved in the cohort who underwent breast reconstruction after mastectomy compared to the cohort who did not undergo reconstruction.<sup>21</sup> Despite this finding, 21% of patients were dissatisfied with their reconstruction or regretted their decision to pursue breast reconstruction.<sup>21</sup> Decision regret based on breast reconstruction type was not evaluated.

## CONCLUSIONS AND FUTURE DIRECTIONS

This summary has shown that decision regret after breast reconstruction surgery is a complex phenomenon

influenced by a variety of factors. Factors such as unmet expectations, patient demographics, oncologic resection, lack of understanding of the procedure, and postoperative complications all contribute to the experience of decision regret.

Most of the research on decision regret in plastic surgery revolves around breast reconstruction, and the lack of sufficient studies on the topic should be noted when reading this review. There exists even less data available on the experience of decision regret in aesthetic procedures, such as breast augmentation, abdominoplasty, rhinoplasty, and face-lifts. Such cohorts may be vulnerable to postoperative decision regret due to there being a more psychological rather than medical necessity contributing to their choice in pursuing a procedure. Further research is needed to understand the incidence and underlying causes of decision regret in aesthetic surgery, to develop effective strategies to prevent it and support patients who experience it.

Based on the findings discussed in this summary, suggestions for the improvement of decision regret include creating a thorough, standardized preoperative educational tool. Providing patients with a clear understanding of the procedure, alternative options, postoperative expectations, and possible complications increases self-efficacy and may prove beneficial in reducing decision regret. An additional recommendation would be to provide a postoperative DRS for every patient undergoing an aesthetic procedure. This would allow surgeons to be aware of the phenomenon and address the issue with appropriate patient-surgeon communication.

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## DISCLOSURES

*The authors have no financial interest to declare in relation to the content of this article.*

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## REFERENCES

1. Wilkens SC, Ring D, Teunis T, et al. Decision aid for trapeziometacarpal arthritis: a randomized controlled trial. *J Hand Surg Am.* 2019;44:247.e1–247.e9.
2. Brehaut JC, O'Connor AM, Wood TJ, et al. Validation of a decision regret scale. *Med Decis Making.* 2003;23:281–292.
3. Bustos VP, Bustos SS, Mascaro A, et al. Regret after gender-affirmation surgery: a systematic review and meta-analysis of prevalence. *Plast Reconstr Surg Glob Open.* 2021;9:e3477.
4. Williams DC, Seifman MA, Hunter-Smith DJ. Patient related outcome measures for breast augmentation mammoplasty: a systematic review. *Gland Surg.* 2019;8:425–430.
5. Barone M, Cogliandro A, Di Stefano N, et al. A systematic review of patient-reported outcome measures after rhinoplasty. *Eur Arch Otorhinolaryngol.* 2017;274:1807–1811.
6. News G. How I feel about my decision to get cosmetic surgery. Available at <https://www.theguardian.com/commentisfree/2017/feb/15/how-i-feel-about-my-decision-to-get-cosmetic-surgery-10-years-on>. Accessed February 25, 2023.
7. Wong B. Adults who got plastic surgery as teens reveal their regrets about it. *The Huffington Post.* Available at [https://www.huffpost.com/entry/people-regret-plastic-surgery\\_1\\_6259cc86e4b052d2bd61d91c](https://www.huffpost.com/entry/people-regret-plastic-surgery_1_6259cc86e4b052d2bd61d91c). Accessed February 25, 2023.
8. Group MA. Do you regret having cosmetic surgery? Available at <https://www.medicalaccidentgroup.co.uk/news/do-you-regret-having-cosmetic-surgery/>. Accessed February 25, 2023.
9. YaleMedicine. Aesthetic plastic surgery. Yale medicine. Available at [https://www.yalemedicine.org/conditions/plastic-surgery-techniques#:~:text=Aesthetic%20plastic%20surgery%20\(also%20called,removal%20of%20fat%20\(liposuction\).](https://www.yalemedicine.org/conditions/plastic-surgery-techniques#:~:text=Aesthetic%20plastic%20surgery%20(also%20called,removal%20of%20fat%20(liposuction).) Accessed March 20, 2023.
10. Thorarinsson A, Frojd V, Kolby L, et al. Long-term health-related quality of life after breast reconstruction: comparing 4 different methods of reconstruction. *Plast Reconstr Surg Glob Open.* 2017;5:e1316.
11. Eltahir Y, Werners L, Dreise MM, et al. Quality-of-life outcomes between mastectomy alone and breast reconstruction: comparison of patient-reported BREAST-Q and other health-related quality-of-life measures. *Plast Reconstr Surg.* 2013;132:201e–209e.
12. Elder EE, Brandberg Y, Bjorklund T, et al. Quality of life and patient satisfaction in breast cancer patients after immediate breast reconstruction: a prospective study. *Breast.* 2005;14:201–208.
13. Zhong T, Hu J, Bagher S, et al. Decision regret following breast reconstruction: the role of self-efficacy and satisfaction with information in the preoperative period. *Plast Reconstr Surg.* 2013;132:724e–734e.
14. Cai L, Momeni A. The impact of reconstructive modality and postoperative complications on decision regret and patient-reported outcomes following breast reconstruction. *Aesthetic Plast Surg.* 2022;46:655–660.
15. Shammas RL, Sergesketter AR, Taskindoust M, et al. Assessing the influence of failed implant reconstruction on patient satisfaction and decision regret after salvage free-flap breast reconstruction. *J Reconstr Microsurg.* 2022;38:441–450.
16. Shammas RL, Sergesketter AR, Taskindoust M, et al. An assessment of patient satisfaction and decisional regret in patients undergoing staged free-flap breast reconstruction. *Ann Plast Surg.* 2021;86(6S suppl 5):S538–S544.
17. Zhong T, Bagher S, Jindal K, et al. The influence of dispositional optimism on decision regret to undergo major breast reconstructive surgery. *J Surg Oncol.* 2013;108:526–530.
18. Luan A, Hui KJ, Remington AC, et al. Effects of a novel decision aid for breast reconstruction: a randomized prospective trial. *Ann Plast Surg.* 2016;76:S249–S254.
19. Klifto KM, Khan H, Manahan MA, et al. Decision aid for women with newly diagnosed breast cancer seeking breast reconstruction surgery: a prospective, randomized, controlled, single-blinded, pilot study. *J Plast Reconstr Aesthet Surg.* 2021;74:2519–2526.
20. Deliere A, Attai D, Victorson D, et al. Patients undergoing bilateral mastectomy and breast-conserving surgery have the lowest levels of regret: the WhySurg study. *Ann Surg Oncol.* 2021;28:5686–5697.
21. Fortunato L, Loreti A, Cortese G, et al. Regret and quality of life after mastectomy with or without reconstruction. *Clin Breast Cancer.* 2021;21:162–169.