

Transgender and Gender-nonbinary Patient Satisfaction after Transmasculine Chest Surgery

Valeria P. Bustos, MD*
 Samyd S. Bustos, MD†
 Andres Mascaro, MD‡
 Gabriel Del Corral, MD, FACS§
 Antonio J. Forte, MD, PhD, MS¶
 Pedro Ciudad, MD, PhD||
 Esther A. Kim, MD, FACS**
 Howard N. Langstein, MD††
 Oscar J. Manrique, MD, FACS††

Background: Transmasculine chest surgery is the most common surgery performed in transmasculine patients, with high overall acceptance and low postoperative complication rates. Trends have shown clear improvement in quality of life and satisfaction. However, to the best of our knowledge, overall patient satisfaction after transmasculine chest surgery and associated factors are largely unknown. The aim of this study is to estimate the overall patient satisfaction in transgender men and non-binary population after transmasculine chest surgery and to assess associated factors. **Methods:** A systematic review was conducted by searching literature in several databases. Meta-analyses of prevalence with a random-effect model for overall and subgroup prevalence were performed. Meta-regression, publication bias, and sensitivity analyses were conducted.

Results: A total of 1052 transmasculine patients underwent any type of transmasculine chest surgery. The pooled overall postoperative satisfaction was 92% [95% confidence interval (CI) 88–96%]. In the subgroup metanalysis, patient satisfaction after periareolar mastectomy was 93% (CI 88%–97%) and after mastectomy with or without free nipple grafting was 90% (CI 84%–95%). Patient satisfaction for studies with mean follow-up >1 year was 91% (CI 83%–97%) and for mean follow-up of 1 year or less was 93% (CI 89%–96%).

Conclusions: This study shows a high level of satisfaction in transmasculine chest surgery for both techniques, which remain stable over time. Also, our results show that this procedure impacts patient satisfaction beyond chest appearance and surgical outcomes. This corroborates its broad acceptance and the improvements in the standard of care, and decision-making approach. (*Plast Reconstr Surg Glob Open* 2021;9:e3479; doi: [10.1097/GOX.0000000000003479](https://doi.org/10.1097/GOX.0000000000003479); Published online 19 March 2021.)

INTRODUCTION

Transmasculine chest surgery, also known as chest masculinization surgery or transmasculine top surgery, is

*From the Division of Plastic and Reconstructive Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Mass.; †Department of Plastic Surgery, University of Pittsburgh, Pittsburgh, Pa.; ‡Department of Plastic and Reconstructive Surgery, Cleveland Clinic, Weston, Fla.; §Department of Plastic and Reconstructive Surgery, MedStar Georgetown University Hospital, Wash.; ¶Division of Plastic and Reconstructive Surgery, Mayo Clinic, Jacksonville, Fla.; ||Department of Plastic, Reconstructive and Burn Surgery, Arzobispo Loayza National Hospital, Lima, Peru; **Division of Plastic and Reconstructive Surgery, University of California, San Francisco, Calif.; and ††Division of Plastic and Reconstructive Surgery, University of Rochester Medical Center, Strong Memorial Hospital, Rochester, N.Y.

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usually the first, arguably the most important, and a common surgical intervention among transgender patients.^{1–3} The goal of this surgery is the creation of an aesthetically pleasing male chest that aligns better with transmasculine patients' gender identity to easily acquire their male gender role in society. The objectives are to remove breast tissue and excessive skin, reduce and, if necessary, reposition the nipple-areola complex, eliminate the inframammary fold, and minimize scarring.⁴

In the 2015 US transgender survey, 97% of transmasculine individuals mentioned that they either have had or may someday want to have a transmasculine chest surgery.⁵ Several surgical techniques for transmasculine chest surgery have been described, and attempts to define indications for each type of surgery have translated into different algorithms based upon skin redundancy or elasticity, breast volume, skin envelope, grade of breast ptosis, or a combination of these characteristics.^{1,2,4,6–9} Despite

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these algorithms, the final decision is usually made after a thorough surgeon–patient discussion, considering patient safety, interests, and goals, and surgeon’s experience.

Transmasculine chest surgery plays an important role in gender affirmation care. These surgeries are well-known, efficient, and safe with high acceptance among patients.^{2,10,11} Similarly, they confer patients with a better quality of life by improving their chest dysphoria.^{12–15} Despite the apparent perception of high satisfaction among patients that undergo transmasculine chest surgery, to the best of our knowledge, a meta-analysis of prevalence of the overall satisfaction as the main outcome in patients who undergo this procedure has not been reported. Hence, the aim of this study was to estimate the overall satisfaction after transmasculine chest surgery in transmasculine and gender non-binary patients (TGNB), using a meta-analysis of prevalence and identify factors impacting satisfaction.

METHODS

Search Methodology

This systematic review and meta-analysis followed the Preferred Reporting Items for Systematic Reviews and Meta-analysis statement.¹⁶ A comprehensive research of several databases from each database’s inception was conducted on June 15, 2020.¹⁶ The databases used were PubMed, Embase, Scopus, Web of Science, Cochrane Database of Systematic Reviews, and Author Supplied. The research strategy was designed and conducted with the help of a librarian. Controlled vocabulary with keywords was conducted to search for studies of transmasculine chest surgeries in transgender and nonbinary population. (See Supplemental Digital Content 1, which displays the search strategy. <http://links.lww.com/PRSGO/B596>.)

Study Selection

A 2-stage screening was conducted for study selection through Covidence.¹⁷ Two researchers (VPB and SSB) conducted the first and second screening process by reviewing titles and abstracts, and full texts from screened abstracts, respectively. If there were discordances in the screening, a third reviewer (OJM) moderated a discussion and, after that discussion among the 3 reviewers, a final decision was made. Inclusion criteria were all articles that included participants 18 years or more who underwent transmasculine chest surgery and reported level of satisfaction, and observational or interventional studies in English or Spanish. Exclusion criteria were letter to editors, preliminary papers, social media observations, case series involving <10 patients, case reports correspondences, and animal studies.

Data Extraction and Synthesis

We identified the authors, year of publication, country of origin, number of participants in each study, and their mean age and follow-up periods from surgery to the day of assessment of satisfaction, type of surgical technique, and type of assessment tool used for postoperative satisfaction.

We considered “patient satisfaction” as any tool that assessed overall patient-reported outcomes of breast, nipple, chest, and/or aesthetic satisfaction. If there was more than 1 reported domain or type of surgery, we calculated the weighted average. Additionally, we identified the number of participants in each study (if mentioned) who responded to be satisfied (“very satisfied,” “satisfied,” or “agree” to be satisfied with surgical results or reported “excellent” or “very good” surgical results).

Quality Assessment

The National Institute of Health (NIH) quality assessment tool was used to assess the risk of bias among the selected studies.¹⁸ According to this tool, the articles were classified as “good,” “fair,” or “poor,” and we categorized each article into “low risk,” “moderate risk,” or “high risk” of bias, respectively.

Outcomes

Our primary outcome was the overall patient satisfaction among TGNB population who underwent any type of transmasculine chest surgery. Our secondary outcome was to discriminate the difference in estimation of satisfaction based on the type of surgical technique [periareolar mastectomies and inframammary skin resection with or without free nipple graft (FNG)] and follow-up time (1-year or more versus <1-year follow-up).

Statistical Analysis

Given that several studies do not specify necessary information to calculate the standard error of the mean, we decided to transform these data into proportions based on the criteria mentioned above. With these data, we conducted a meta-analysis of proportions based on the number of patients who reported to be satisfied with the results of their breast/chest area and/or nipples. The data were analyzed, and the pooled overall satisfaction was estimated using meta-analysis with Stata Software/IC (version 16.1).¹⁹ Due to the high variability among studies, a logistic-normal random effect model was conducted. The 95% exact confidence intervals (CIs) for study-specific proportions and 95% Wald CI for the overall pooled estimates with Freeman-Tukey double arcsine transformation were used.^{19,20} The effect size and percentage of weight from each individual study was presented. Also, a subgroup meta-analysis was conducted for follow-up time and type of surgical procedure.

I^2 statistics was used to assess heterogeneity across studies. High heterogeneity was considered if $I^2 > 50\%$. $P < 0.05$ was considered statistically significant. Also, univariable meta-regression was conducted to assess significance in year of publication, tools of measurement, and risk of bias.

To assess publication bias, funnel plot and the Egger test were performed. If this test showed no statistical significance ($P > 0.05$), we assumed that the publication bias had a low impact on the results from this study. We used the trim-and-fill method to assess the impact of the missing studies.

Sensitivity analysis was conducted to assess the magnitude and impact of covariates to our overall pooled estimation of patient satisfaction. We excluded high-risk bias studies and studies with <20 participants.

RESULTS

Included Studies

A total of 296 articles from the search strategy and studies from additional sources were identified. The first screening process yielded 34 articles, and the second screening generated 22 articles, which were included in the systematic review. A total of 14 studies were used for

meta-analysis. In Figure 1, the Preferred Reporting Items for Systematic Reviews and Meta-analysis flow diagram is presented.

Quality Assessment

With the NIH Quality Assessment tool, almost all studies were ranked “good” and “fair.” (See **Supplemental Digital Content 2**, which shows the ranking from each individual study. <http://links.lww.com/PRSGO/B597>.)

Study Characteristics

A total of 1052 transmasculine individuals and 16 nonbinary individuals underwent transmasculine chest

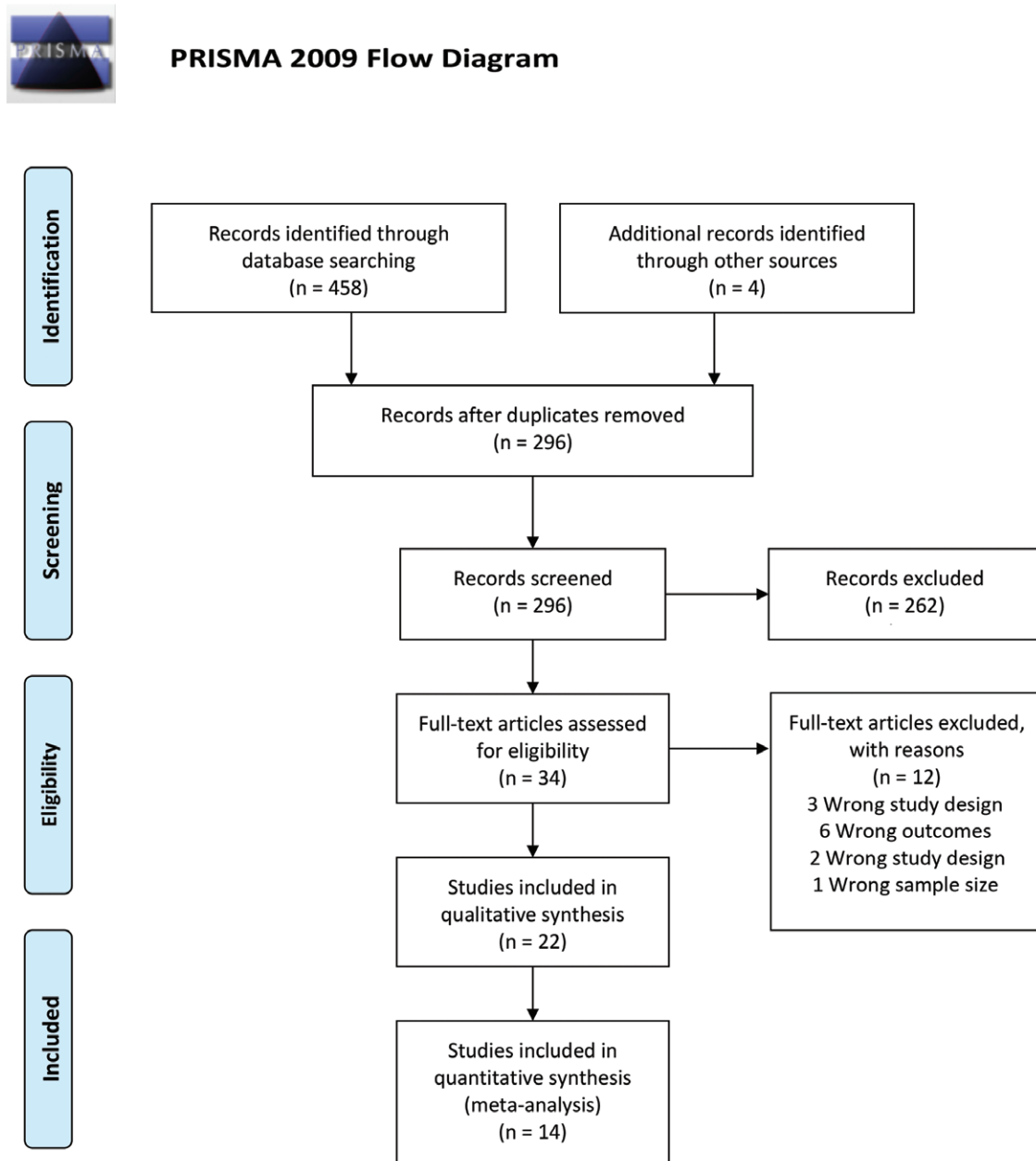


Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-analysis flow diagram.

surgery. The age ranged from 17.2 to 37.8 years. Only 4 studies used standardized questionnaires to assess patient satisfaction.^{12–14,21} (Table 1).

A total of 296 (38.3%) patients underwent any type of periareolar mastectomy: 140 (18.1%) were semicircular periareolar mastectomy, 129 (16.7%) were concentric circular periareolar mastectomy, 25 (3.2%) were extended concentric periareolar, 2 (0.3%) were transareolar. A total of 475 (61.4%) patients underwent inframammary skin resection mastectomy with or without FNG: 344 (44.5%) underwent mastectomy with FNG, 121 (15.7%) underwent inferior pedicle mammoplasty, 10 (1.3%) mastectomies that do not specify if the patients had FNG. A total of 2 (0.3%) underwent liposuction only (Table 2).

Satisfaction Assessment Tools

In Table 1, overall satisfaction and assessment tools from each study are shown. There is a high level of overall satisfaction. The majority of the studies that used a Likert scale of 5-point, all of them reported levels of satisfaction >3.9, and 4 studies reported overall satisfaction >4.50.^{1,6,22–28}

From all the surgical techniques, semicircular periareolar mastectomy was the most satisfactory compared with

other techniques (Table 2).^{8,13,22,24–26,29} Liposuction alone had the lowest overall satisfaction (2.2); however, only 1 study used this technique.²⁵

Pooled Overall Patient Satisfaction

The pooled overall patient satisfaction from the studies included in the meta-analysis was 92% (95% CI 88%–96%, I² = 65.6%) (Fig. 2).^{6,8,14,22–24,26–33} The majority of TGNB patients underwent mastectomy with FNG.

Subgroup Analysis

In a subgroup meta-analysis, patient satisfaction after periareolar mastectomy was 93% (CI 88%–97%, I² = 00.0%), and after mastectomy with or without FNG was 90% (CI 84%–95%, I² = 35.1%) (Fig. 3). In subgroup meta-analysis for follow-up time, patient satisfaction for studies with mean follow-ups <1-year was 91% (CI 83%–97%, I² = 26.1%), and for mean follow-ups of 1-year or less was 93% (CI 89%–96%, I² = 4 5.2%) (Fig. 4).

Meta-regression and Publication Bias

From the covariates analyzed, none affected the pooled endpoint in this meta-analysis. When assessing publication bias, the funnel plot showed asymmetry between the

Table 1. Study Characteristics

Author, Year	Country	No. Patients	Mean Age, y (SD, Range)	Follow-up, Mo (Range)	Satisfaction Assessment Tool	Overall Satisfaction	Risk of Bias
Agarwal et al, 2018	USA	42	27.7 (18–50)	6	BREAST-Q	85%	L
Bustos et al, 2020	USA	34	Md 27 DIFNG/ Md 24 DINS	DIFNG: 13 (12–13) DINS: 11.5 (9–15)	BODY-Q	76.6%	L
Frederick et al, 2017	USA	57	Md 24 (15–71)	1 wk, 3 wk, 3 mo and 12 mo	5-point scale survey	4.77	L
Berry et al, 2012	UK	100	Md 28 (18–55)	6 wk, 6 mo	5-point scale survey	3.98	L
Top et al, 2017	Turkey	52	28.2 (18–47)	28 (12–56)	5-point scale survey	4.44	M
Van De Grift et al, 2016	Netherlands	33	26.1 (18–59)	10.0 (6–16)	BIS*	2.66	L
Wolter et al, 2018	Germany	170	27.4 (18–52)	14 d, 3 mo, 12 mo	4-point scale survey†	1.42	L
Marinkovic et al, 2017	USA	14	17.2 (13.4–19.7)	19.2 (1.2–43.2)	5-point scale survey	4.9	M
Wolter et al 2015	Germany	158	28.6 (16–54)	14 d, 3 mo, 12 mo	4-point scale survey†	1.64†	L
Monstrey et al, 2008	Belgium	28	NS	NS	5-point scale survey	4.14	L
Morselli et al, 2019	Italy	68	33 (21–55)	NS	5-point scale survey	4.57	M
Nelson et al, 2009	London	12	31 (20–45)	32 (8–60)	Questionnaire	• Very satisfied (8) • Satisfied (3) • Unsatisfied (1)	L
Esmonde et al, 2018	Portland	33	29.5 (SD 7.60)	1.97 (SD 1.22) (0.17–6.2)	Ad hoc questionnaire	4.88 (QoL)	H
Poudrier et al, 2019	USA	45	33 (18–58)‡	(3 to >72)	Survey questions (Generated from the BREAST-Q)	• Agree 98% • Neutral 2% • Disagree 0% • Very satisfied (15) • Satisfied (4) • Unsatisfied (1)	M
Rahmati et al, 2020	Iran	20	NS	12	Questionnaire	• Very satisfied (15) • Satisfied (4) • Unsatisfied (1)	H
Van De Grift et al, 2017	Netherlands	26	25.8 (18–59)	12	10-point scale survey	7	L
Van De Grift et al, 2018	Netherlands	49	26.4 (SD 7.7)	26 (6–68)	BODY-Q	64.6%	L
Van De Grift et al, 2018(2)	Netherlands, Belgium, and Germany	49	36.3§	NS	5-point scale survey	NS	M
De Cuyper et al, 2005	Belgium	14	37.8 (SD 8.9)	45.6 (SD 2.7)	5-point scale survey	4.14	M
Rothenberg et al, 2018	USA	14¶	Me 28 (21–49)	1 wk	NS	NA	M
Lorusso, 2017	Italy	16	31 (22–41)	3, 6, and 12 mo	4-point scale survey	3.81	M
Ayyala, 2020	USA	18	29 (19–49)	6 (3–32)	5-point scale survey	4.47	L

*5-point scale = (1) very satisfied to (5) very dissatisfied.

†4-point scale = (1) very satisfied, (2) satisfied, (3) less satisfied, (4) no satisfied.

‡13 more subjects were nonbinary; mean age include both populations.

§Includes both transmasculine and transfeminine participants.

¶Three participants were nonbinary; the mean included both populations.

BIS, Body Image Scale for Transsexuals; DIFNG, double-incision mastectomy with free nipple grafting; DINS, double-incision mastectomy with nipple sharing technique; Md: median; NA: Not applicable; NS, not specified.

Table 2. Patient Satisfaction by Type of Mastectomy

Type of Mastectomy	Author, Year	No. Surgeries Performed per Patient (per Breast)	Patient Satisfaction*	
Semicircular periareolar mastectomy	Top et al, 2017	17 (34)	4.64	
	Wolter et al, 2018	36 (72)	1.39	
	Marinkovic et al, 2017	4 (8)	4.9	
	Wolter et al, 2015	22 (44)	1.54	
	Monstrey et al, 2008	6 (12)	4.5	
	Van De Grift et al, 2018	6 (12)	66	
	Frederick et al, 2017	40 (80)	4.78	
Transareolar mastectomy	Berry et al, 2012	9 (18)	3.45	
	Monstrey et al, 2008	2 (4)	4.0	
Concentric circular periareolar mastectomy	Wolter et al, 2018	26 (52)	1.46	
	Top et al, 2017	7 (14)	4.42	
	Wolter et al, 2015	29 (58)	1.65	
	Monstrey et al, 2008	6 (12)	4.5	
	Rahmati et al, 2020	20 (40)	Very satisfied (15) Satisfied (4) Unsatisfied (1)	
Extended concentric periareolar mastectomy	Van De Grift et al, 2017	14 (28)	7.0	
	Van De Grift et al, 2018	27 (54)	65.5	
	Monstrey et al, 2008	9 (18)	3.6	
	Berry et al, 2012	4 (8)	4.5	
	Top et al, 2017	12 (24)	4.58	
Mastectomy with or without FNG Mastectomy with FNG	Marinkovic et al, 2017	10 (20)	4.9	
	Bustos et al, 2020	34 (68)	76.6	
	Ayyala, 2020	18 (36)	4.77	
	Frederick et al, 2016	48 (96)	4.76	
	Berry et al, 2012	85 (170)	4.01	
	Wolter et al, 2018	84 (168)	1.37	
	Wolter et al, 2015	26 (52)	1.65	
	Monstrey et al, 2008	5 (10)	4.3	
	Lorusso, 2017	16 (32)	3.81	
	Van De Grift et al, 2018	16 (32)	62.5	
	Van De Grift et al, 2017	12 (24)	7.0	
	Inferior pedicle mammoplasty	Wolter et al, 2018	24 (48)	1.58
		Wolter et al, 2015	81 (162)	1.65
		Top et al, 2017	16 (32)	4.13
Liposuction only	Berry et al, 2012	2 (4)	2.2	

*Refer to Table 1 to evaluate satisfaction's assessment tool.FNG, Free nipple grafts.

studies (Fig. 5). An Egger test suggested low statistical significance in publication bias (p -value = 0.8047). The Trim & Fill method imputed 22 additional studies, which had an irrelevant impact on the adjusted result. It had a change of effect size from 0.907 to 0.925, with no change in the statistical significance.

Sensitivity Analysis

The overall patient satisfaction was not significantly changed by the excluded studies. The overall satisfaction was 92% (CI 86%–96%, $I^2 = 77.7%$), which is equal to that calculated with the inclusion of such studies (92%, CI 88%–96%, $I^2 = 65.6%$).

DISCUSSION

Transmasculine chest surgery positively impacts TGNB patients by targeting and reducing chest dysphoria. These surgeries help achieve a better alignment between secondary sexual characteristics and gender identity. It is well known that mastectomy is the first and most acceptable gender affirmation surgeries among transmasculine patients.¹ Consequently, there have been many studies in the surgical and medical literature evaluating different levels of satisfaction among this population. However, to the best of our knowledge, this is the first systematic review and meta-analysis that generates an estimation

of the overall patient satisfaction among TGNB patients after transmasculine top surgery and identifies associated factors. In this study, the pooled patient's satisfaction was 92% (CI 88%–96%), which corroborates that patients are highly satisfied with transmasculine chest surgery.

Validated Assessment Tools

In 2017, Borene et al reported a systematic review of patient-reported outcome tools following gender affirmation surgeries.^{34,35} The authors argued that a complete assessment instrument must have functional, psychorelational, and cosmetic survey questions and should follow the rules of the US Food and Drug Administration and the Scientific Advisory Committee of the Medical Outcome Trusts.^{34,35} Among all studies, the only validated tool was the BREAST-Q, described by Pusic et al.³⁴⁻³⁶ Not surprisingly, the authors concluded that there is a lack of validated tools to assess patient satisfaction in this patient population. Similarly, most studies in our systematic review did not count with a validated tool to assess satisfaction in TGNB patients. This leads to an enormous subjectivity of the variable of interest. Additionally, this reflects the need of awareness among researchers and surgeons to use existent validated tools or create new ones to achieve more reliable data.

The vast majority used a Likert-type scale survey, an ordinal psychometric measurement of attitudes.³⁷ In this

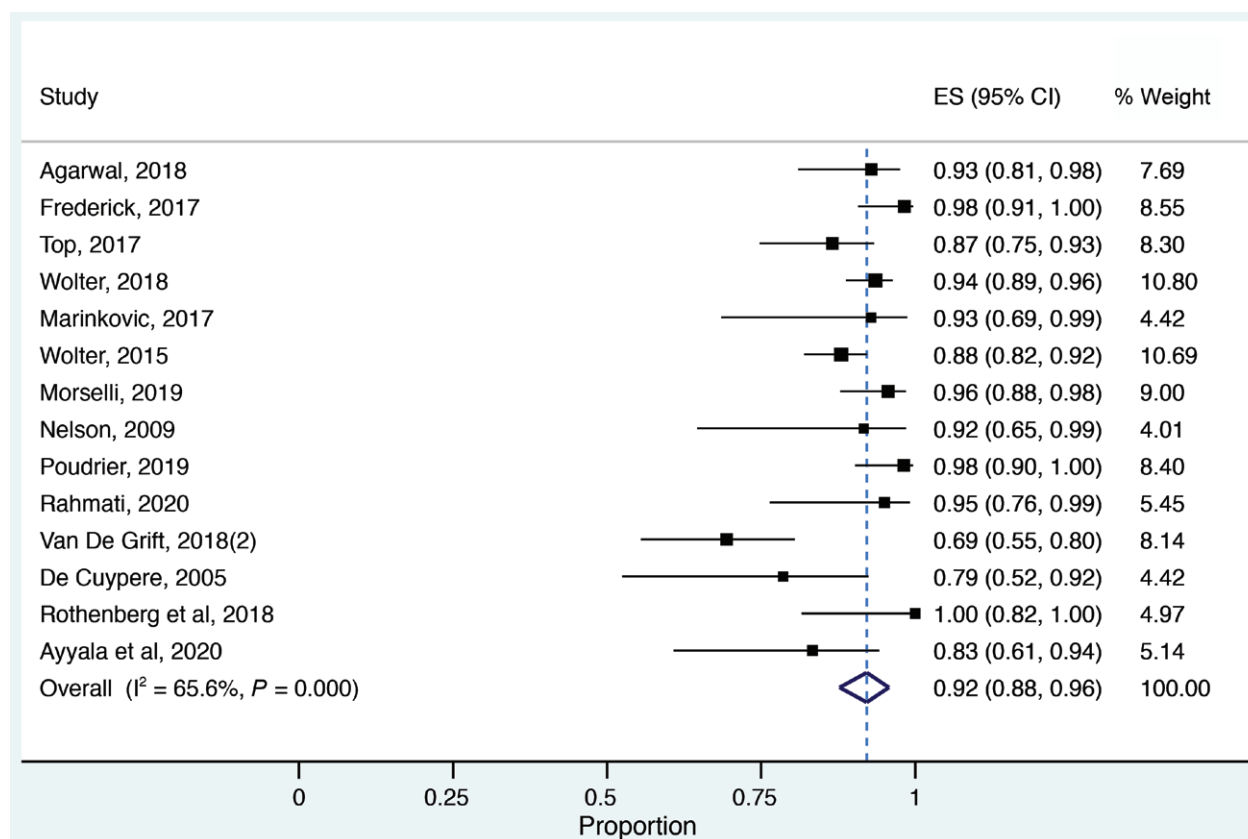


Fig. 2. Pooled overall patient satisfaction of TGNB population who underwent transmasculine chest surgeries. Heterogeneity $\chi^2 = 37.78$ (d.f. = 13), $P = 0.00$, I^2 (variation in ES attributable to heterogeneity) = 65.59%, estimate of between-study variance $\tau^2 = 0.04$, test of effective size (ES) = 0, $z = 33.92$, $P = 0.00$.

type of scale, the concept relies on indicating the degree of agreement or disagreement for a specific statement.³⁷ Major advantages of this scale are its universal acceptance and use, easy interpretation and understanding, and inexpensiveness.³⁸ Similarly, it may be a quantifiable scale, which confers the possibility to compute mathematical analyses. However, it is a uni-dimensional scale, where the space between categories cannot be assessed, conveying uncertainty in the distance between each point. In addition, it fails to measure true attitudes of respondents, and more importantly, participants can be influenced by previous questions or avoid the use of extreme options. Given these drawbacks, the reliability and validity of such scales remain uncertain. This and the fact that many studies did not include values or data necessary to calculate effect sizes and/or standard error for inclusion in a meta-analysis of a continuous outcome, we decided to use the proportion of patients who reported to be “satisfied,” “very satisfied,” or “agree to be satisfied” in our meta-analysis of prevalence.

Follow-up time

Several studies had a mean follow-up time of <1 year. Assessment of satisfaction with a relatively short follow-up time may not represent a realistic picture of the long-term status. This 1-year period after surgery is usually called the “honeymoon period.”²³ Studies with a mean follow-up time >1 year showed an overall satisfaction of 91% (CI

83%–97%), which is less compared with the overall satisfaction with mean follow-up time of 1 year or less [93% (CI 89%–96%)]. However, we believe this slight difference is attributed to the small number of studies (5) that had more than 1-year follow-up, rather than due to a true difference between both groups. Moreover, this difference was not statistically significant.

In this respect, Poudrier et al, in 2019, conducted a study to evaluate a linear association between surgical timing and surgical satisfaction.³¹ The authors found no difference regarding follow-up time and surgical satisfaction. In fact, they found clinical and statistical significance in patients’ bodily satisfaction, psychosocial well-being, and sexual satisfaction following mastectomy in all follow-up times (3 months, late 6 months, and 1 year follow-up after surgery).³¹ However, this study did not use a validated assessment tool.³¹ In conclusion, the high level of satisfaction appears to remain stable over time. However, more studies should be focused on the long-term follow-up assessment of satisfaction in this population to have robust evidence of the extent of this positive perception.

Surgical Technique

Some studies assessed differences in satisfaction between types of mastectomy. The pooled patient satisfaction for periareolar mastectomy was 93% (CI 88%–97%),

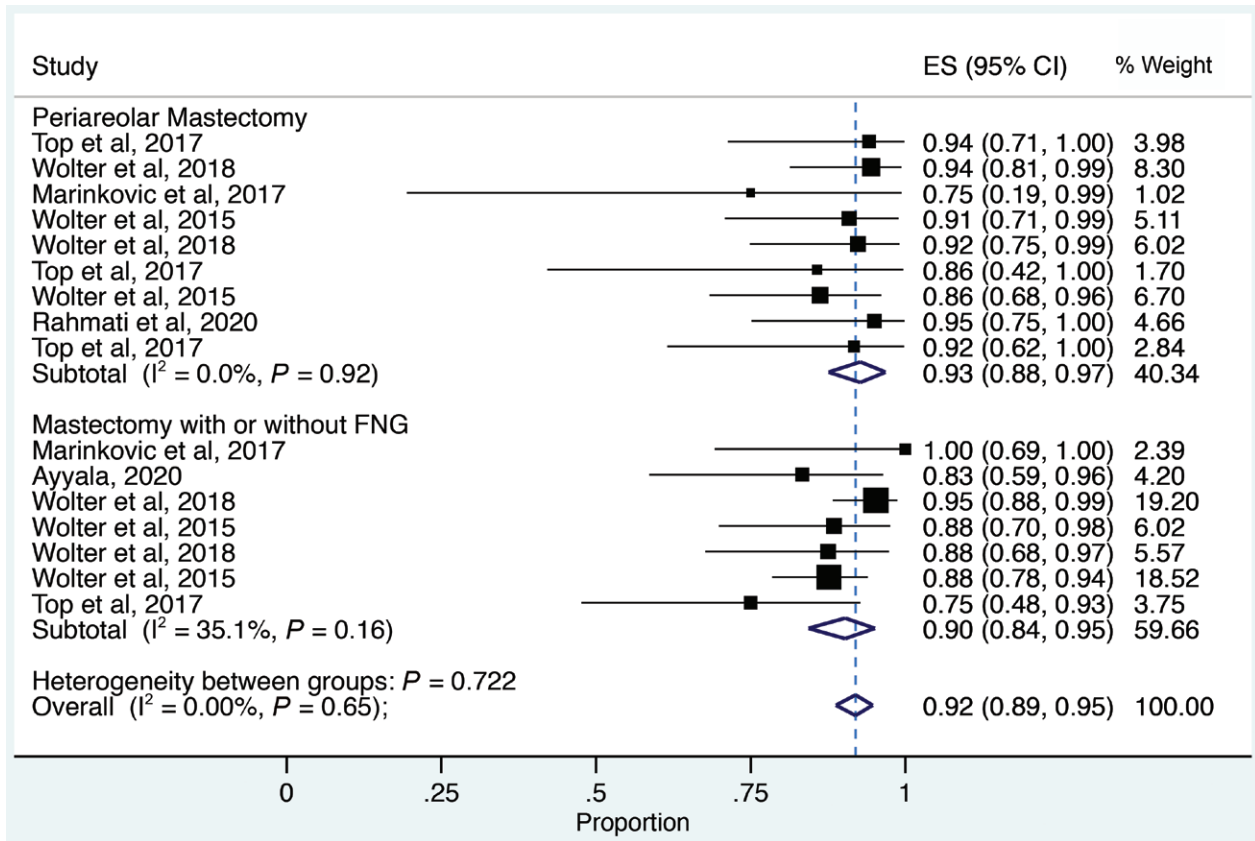


Fig. 3. Subgroup pooled patient satisfaction by type of mastectomy in TGNB population after transmasculine chest surgeries. I^2 , variation in effect size (ES) attributable to heterogeneity.

and the overall satisfaction for subcutaneous mastectomy with or without FNG was 90% (CI 94%–95%). With this information, we can conclude that both surgical techniques have high satisfaction levels, and their difference is minimal.

In fact, Frederick et al, in 2017, demonstrated no statistical significance in mean satisfaction between mastectomy with FNG and nipple-sparing mastectomy.²⁴ In this study, the major concerns among satisfied patients were nipple appearance, scar, and contour irregularities.²⁴ Interestingly, despite algorithmic approaches, many patients requested nipple-sparing mastectomy, mainly because of the relatively short and inconspicuous scar.²⁴ Monstrey et al and Berry et al found high rates of satisfaction in concentric circular group and primary extended periareolar mastectomy techniques.^{1,25} These results are expected because nipple-sparing techniques are surgical procedures that remove breast tissue through a small incision around the nipple, with significantly reduced scarring.

On the other hand, Van De Grift et al, in 2016, studied 2 mastectomy techniques (concentric circular and inframammary fold and FNG) pre and postoperatively, and found that both mastectomies statistically improved satisfaction with the chest and hips, and in social and hair growth items.³⁹ Marinkovic et al reported high satisfaction with both surgical techniques.²² Also, Bustos et al, in

2020, presented a novel technique for nipple reconstruction, named nipple split sharing, which has been shown to yield superior aesthetic outcomes, particularly for the nipple-areola complex masculine aspect, size, contour, scarring, and position compared with the traditional FNG technique.²¹ These results demonstrated that these surgeries positively impact patient satisfaction in a level that goes beyond the chest appearance.

Factors Associated with Satisfaction

We identified several factors associated with the level of satisfaction among patients who underwent mastectomies. Bustos et al found that the total average aesthetic outcomes were superior with the nipple split sharing technique for patients who undergo double incision mastectomy.²¹ They argued that, with this technique, nipple-areola complexes had a more masculine aspect, adequate size and contour, and less scarring.²¹ Frederick et al suggested that the most important factors for “satisfied” patients were nipple appearance, scar, and contour irregularities.²⁴ Van De Grift et al found that the strongest positive correlation of satisfaction was chest shape and symmetry.⁴ Additionally, these surgeries were found to positively impact patient’s lives, self-confidence, and social interactions.²² Likewise, they have been reported to improve quality of life, sexual confidence, psychosocial functioning, and decrease burden of depression.^{22,31,27}

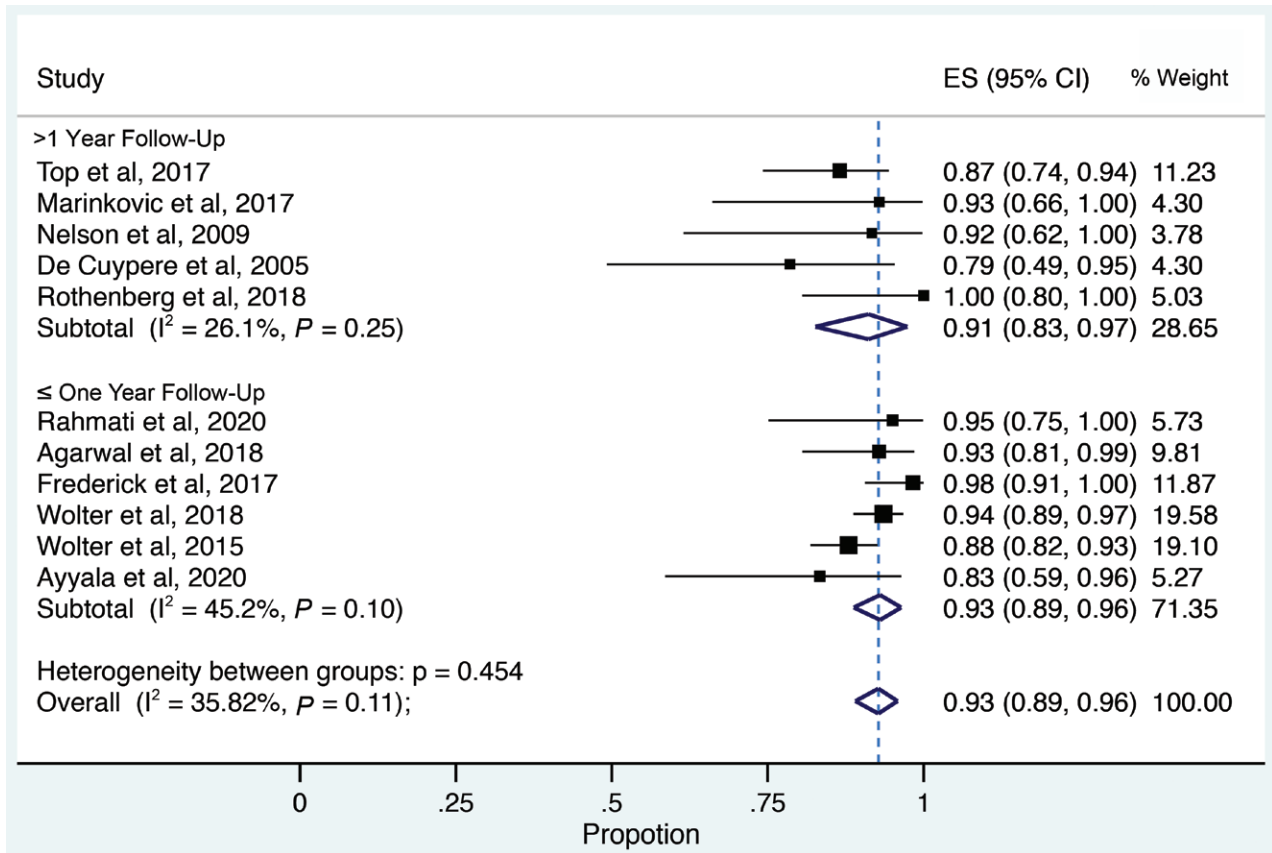


Fig. 4. Subgroup pooled patient satisfaction by follow-up time in TGNB population after transmasculine chest surgeries. I^2 , variation in effect size (ES) attributable to heterogeneity.

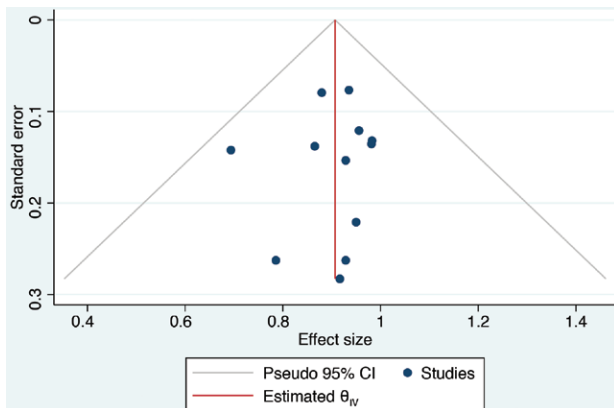


Fig. 5. Funnel plot.

On the other hand, Frederick et al identified that the major concern for “very unsatisfied” patient was scarring and contour irregularities.²⁴ Surgical complications have also been linked with dissatisfaction among this population. Monstrey et al considered moving to FNG techniques despite the generation of scar, and found a low rate of complications (5.4%) and revision surgeries (11.1%) with a good satisfaction rate (4.3 over 5).¹

Hence, a well-performed surgical procedure with good surgical outcomes is indispensable in terms of satisfaction.

According to Van De Grift et al, surgical decision-making should be based not only on physical examination alone, but also on technical and self-reported outcomes.⁴ We believe that our study provides important information to the surgical literature regarding not just the overall prevalence of satisfaction, but also a review of major factors associated with satisfaction, which are indispensable for surgical decision-making.

Considering the limitations of validation and subjectivity of the variable “satisfaction,” our study corroborates the improvements in patient care, algorithms and surgical techniques toward transmasculine chest surgeries. However, in plastic surgery, the necessity of a comprehensive, longitudinal, and validated tool is fundamental to allow surgeons to compare techniques, quantify positive effects, and identify benefits of certain procedures, ultimately improving patient care.^{34,35} Therefore, it is vital for future studies to assess level of satisfaction using a comprehensive, validated instruments, like “TRANS”-Questionnaire,⁴⁰ a recently validated pre and postoperative satisfaction tool in patients undergoing gender affirmation surgery mastectomies, to acquire more robust and reliable data. We encourage researchers to conduct studies in which satisfaction assessment is the primary outcome, to increase the power of the study, and consequently its validity. Additionally, future studies should be made to assess the level of satisfaction discriminating by

type of surgical technique. These considerations will give studies more external validity and impact.

CONCLUSIONS

This study shows a high level of satisfaction in transmasculine chest surgery for both techniques, which remain stable over time. Also, our results show that transmasculine chest surgery positively impacts patient's satisfaction beyond chest appearance and surgical outcomes. This reflects and corroborates its broad acceptance and improvement in the standard of care, surgical technique, and decision-making approach.

Oscar J. Manrique, MD, FACS

Division of Plastic and Reconstructive Surgery
University of Rochester Medical Center
Strong Memorial Hospital
160 Sawgrass Drive, Suite 120
Rochester, NY 14620
E-mail: oscarj.manrique@gmail.com

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