

# Fertility preservation choices and decisional regret after gender-affirming surgery in transgender men or gender nonbinary persons

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**Objective:** To investigate the prevalence of decisional regret regarding preoperative fertility preservation choices after gender-affirming surgery or removal of reproductive organs.

**Design:** Cross-sectional.

**Setting:** University-based practice.

**Patients:** A total of 57 survey respondents identifying as transgender men or gender nonbinary with a history of gender-affirming surgery or removal of reproductive organs between 2014 and 2023 with the University of North Carolina Minimally Invasive Gynecology division.

**Intervention:** Survey or questionnaire.

**Main Outcome Measures:** The prevalence and severity of decisional regret regarding preoperative fertility preservation choices were measured with the use of the validated decisional regret scale (DRS) (scored 0–100). Secondary outcomes included patient-reported barriers to pursuing reproductive endocrinology and infertility consultation and fertility preservation treatment.

**Results:** The survey response rate was 50.9% (57/112). “Mild” to “severe” decisional regret was reported by 38.6% (n = 22) of survey respondents, with DRS scores among all respondents ranging from 0–85. Higher median DRS scores were associated with patient-reported inadequacy of preoperative fertility counseling regarding implications of surgery on future fertility or family-building (0 vs. 50) and fertility preservation options (0 vs. 12.5). No desire for future fertility at the time of fertility counseling was the most frequent reason (68.4%) for declining a referral to reproductive endocrinology and infertility for additional fertility preservation discussion.

**Conclusions:** Decisional regret regarding preoperative fertility preservation choices is experienced among transgender men or gender nonbinary persons after gender-affirming surgery or the removal of reproductive organs. Preoperative, patient-centered fertility counseling and fertility preservation treatments should be provided to reduce the risk of future regret. (*Fertil Steril Rep*® 2024;5: 87–94. ©2023 by American Society for Reproductive Medicine.)

**Key Words:** Transgender, gender nonbinary, fertility preservation, decisional regret

**D**ecisional regret (DR) regarding fertility preservation (FP) decisions (i.e., deferring cryopreservation of gametes or embryos) has been reported by patients after

fertility-limiting medical treatments (e.g., gonadotoxic chemotherapy, radiation) and/or surgical procedures (e.g., hysterectomy, salpingectomy, oophorectomy) (1–7). Gender-affirming

surgery (GAS) for transgender (TG) males or gender nonbinary (TGGNB) persons, which commonly involves the removal of reproductive organs such as the uterus, fallopian tubes, and/or ovaries, has similar, notable effects on future fertility. Research investigating rates of FP counseling and development of DR regarding FP treatment decisions among TGGNB persons having undergone GAS or removal of reproductive organs for other medical indications has lagged despite an

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increase in the number of GAS performed annually and a decrease in the median age at which GAS is being performed (8–10). Like their cisgender counterparts, previous studies have demonstrated that TGGNB adolescents and adults share a desire for future children or family-building, both through biologic and/or adoptive means (11–14). This desire, however, has been met by unique barriers to family-building and FP specific to the lesbian, gay, bisexual, transgender, queer, and intersex (LGBTQI+) community, including lack of insurance coverage, urgency to treat gender dysphoria and begin gender-affirming treatment, and fear of provider stigma or lack of provider LGBTQI+-specific knowledge (15–17). In an effort to address these barriers and provide equitable access to family-building options, multiple medical societies, including the World Professional Association for Transgender Health, the American Society for Reproductive Medicine, and the Endocrine Society, have strongly recommended that TGGNB persons be provided comprehensive fertility counseling and offered referral to a fertility specialist to further discuss FP options before initiating gender-affirming medications or undergoing GAS or removal of reproductive organs (18–20).

Despite these recommendations, documentation of pre-treatment fertility counseling and referral rates to fertility specialists have varied widely (21–23). Lack of fertility counseling, patient-perceived inadequate receipt and quality of counseling, and failure to provide a referral to a fertility specialist may therefore increase the risk of DR among TGGNB persons. When experienced, DR has been associated with increased mental health concerns (e.g., depression, anxiety, anger), poorer medical outcomes, decreased quality of life, and negative experiences with the healthcare system, sequelae for which TGGNB persons and the greater LGBTQI+ community are already at increased risk (15–17, 24, 25). Previous research has demonstrated DR regarding FP choices among a small subset of TGGNB persons seeking gender-affirming treatment (26). These findings, however, were limited by small sample sizes, short follow-up times after treatment, and the inclusion of patients still considering but not yet having undergone treatment. We aimed to investigate the prevalence of DR, specifically after GAS or the removal of reproductive organs, among TGGNB persons at our academic tertiary care center. We also sought to identify factors influencing a patient's choice to accept a referral to a reproductive specialist for further FP counseling before undergoing surgery.

## MATERIALS AND METHODS

This retrospective, cross-sectional survey study was approved by the University of North Carolina's Institutional Review Board (IRB No. 22-2965). Individuals eligible for study participation were identified through our department's minimally invasive gynecology hysterectomy database. Individuals meeting inclusion criteria were those who identified as TG male or gender nonbinary (through use of personal pronouns and/or gender-affirming medication), had undergone GAS or removal of reproductive organs previously for benign indications between the years of 2014 and 2023, and were between

18 and 50 years old at the time of surgery. Individuals who had not undergone or were still considering surgery were excluded from study participation.

The survey was investigator-designed and reviewed by a representative from our institution's Transgender Health Program to ensure the use of gender-affirming or inclusive language. The final survey included questions about basic demographics (e.g., gender identity, sexual orientation, race, and ethnicity) and clinical information (e.g., obstetrical, surgical, fertility counseling, and referral history). To assess participants' experiences with fertility counseling, respondents were asked to recall the occurrence and quality of counseling provided to them, as well as rate the importance of future fertility or family-building before surgery and at the time of survey completion. Additional clinical information (e.g., date of surgery and surgery performed), provider-documented discussion of fertility counseling, and referral to reproductive endocrinology and infertility (REI) consultations were abstracted from medical records.

We aimed to investigate our primary study question (i.e., prevalence of decisional regret) with the use of the decisional regret scale (DRS) (25). The DRS is a validated, five-item scale designed to measure regret after patient treatment-related medical decisions. Scores range from 0–100, with higher scores indicating more severe regret. A score of 0 corresponded to “no regret,” 1–24 to “mild regret,” and  $\geq 25$  to “moderate-to-severe regret” (24).

The survey was administered as a single, online REDCap survey over a 2-week time period in March 2023. An initial survey invitation was sent via e-mail. When no survey response or declination of study participation was received, a single subsequent survey completion reminder e-mail and/or telephone call was then used. No follow-up surveys or interviews were performed, and no incentive was provided for survey completion. The survey was administered in English only.

Demographic and clinical data were characterized using descriptive statistics. Comparisons between survey respondents and nonrespondents were performed using two-sided Student's *t* tests. Associations between variables of interest selected a priori were analyzed with the use of Spearman's correlation, the Mann-Whitney *U* test, or the Kruskal-Wallis test, as appropriate. Statistical significance was defined by two-sided *P* values of  $< .05$ . All statistical analyses were performed with the use of STATA, version 17.0.

## RESULTS

Of the 112 individuals meeting inclusion criteria, 57 completed the survey (response rate: 50.9%). In comparing survey respondents to nonrespondents, a statistically significant difference ( $\pm$ SD) in years since surgery was identified (respondents,  $2.2 \pm 1.7$  years vs. nonrespondents,  $3.7 \pm 2.4$  years,  $P=.0003$ ) (Supplemental Table 1, available online). Among survey respondents, the mean age at the time of survey completion was  $32.6 \pm 9.5$  years, and the mean age at the time of surgery was  $30.2 \pm 9.2$  years (Table 1). The mean time since surgery was  $2.5 \pm 1.8$  years; range, 50 days to 6.7 years). Most respondents reported being assigned female sex at birth

TABLE 1

Characteristics of survey respondents.	
Characteristics	n (%)
<b>Age at time of survey completion (y)</b>	
Mean (±SD)	32.6 (9.5)
Median (IQR)	30 (26–39)
<b>Age at time of surgery (y)</b>	
Mean (±SD)	30.2 (9.2)
Median (IQR)	27 (23–37)
<b>Time since surgery (y)</b>	
Mean (±SD)	2.5 (1.8)
Median (IQR)	2.4 (255 d to 3.5 y)
Range	50 d to 6.7 y
<b>Assigned sex at birth</b>	
Female	55 (98.2)
Male	1 (1.8)
Missing	1
<b>Identify as transgender</b>	
Yes	54 (96.4)
No	2 (3.6)
Missing	1
<b>Gender identity</b>	
Man	47 (83.9)
Woman	0 (0.0)
Nonbinary	5 (8.9)
Prefer to describe myself	4 (7.1)
Missing	1
<b>Sexual orientation</b>	
Lesbian	0 (0.0)
Gay	6 (10.5)
Straight	21 (36.8)
Bisexual	6 (10.5)
Queer	15 (26.3)
Pansexual	7 (12.3)
Asexual	2 (3.5)
<b>Ethnicity</b>	
American Indian or Alaska Native	1 (1.8)
Asian	0 (0.0)
Black or African American	9 (15.8)
Hispanic or LatinX	3 (5.3)
Native Hawaiian or Pacific Islander	0 (0.0)
White or Caucasian	46 (80.7)
<b>Surgery performed</b>	
Hysterectomy, salpingectomy (bilateral or unilateral)	13 (22.8)
Hysterectomy, salpingectomy (bilateral or unilateral), oophorectomy (bilateral or unilateral)	44 (77.2)
<b>History of pregnancy before surgery</b>	
Yes	4 (7.0)
No	53 (93.0)
<b>History of pregnancy after surgery</b>	
Yes	0 (0.0)
No	57 (100.0)
<b>Preoperative fertility counseling documented in EMR</b>	
Yes	57 (100.0)
No	0 (0.0)
<b>Referral to REI offered</b>	
Yes	55 (96.5)
No	2 (3.5)
<b>REI referral accepted or declined</b>	
Accepted	3 (5.5)
Declined	52 (94.5)
Patient response not documented	0 (0.0)

Note: EMR = electronic medical record; IQR = interquartile range; REI = reproductive endocrinology and infertility.

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(98.2%, n = 55) and self-identifying as male at the time of survey completion (83.9%, n = 55). One respondent reported being assigned male at birth (however, he was not excluded from the study as individuals may not identify with their assigned sex at birth). Provider-documented preoperative fertility counseling was 100% (n = 57) (Table 1), although patient-reported receipt of fertility or family-building counseling was 29.8% (n = 17) (Table 2). A total of 96.5% of respondents were offered provider-documented referrals to REI consultations, with 5.5% (n = 3) accepting a referral (Table 1). In contrast, 35.1% (n = 20) of respondents reported being offered a referral to a REI consultation, with one patient reporting accepting a referral (Table 2). This patient attended their appointment but chose not to pursue FP treatment after additional counseling. Most respondents (83.9%, n = 47) felt the implications of surgery on future fertility or family-building and FP options (e.g., oocyte and embryo cryopreservation) (74.6%, n = 41) were discussed adequately before surgery (Table 2).

Regarding previous and current thoughts on future fertility or family-building, 57.9% (n = 33) and 61.4% (n = 35) of respondents reported future fertility or family-building as “not as important” preoperatively and at the time of survey completion, respectively (Table 2). In total, 68.4% (n = 13/19) of respondents reported no desire for future fertility at the time of fertility counseling as a reason to decline referral to a REI consultation. Other factors leading to declining a referral to REI consultations included no desire for biologic children but consideration of or plan for future adoption (52.6%, n = 10), concern regarding discontinuation of gender-affirming medications to pursue FP (31.6%, n = 6), concern regarding worsening gender dysphoria with a future pregnancy (31.6%, n = 6), cost of infertility treatment (26.3%, n = 5), lack of insurance coverage for fertility care (15.8%, n = 3), invasiveness of FP procedures (15.8%, n = 3), and plan for partner to assume fertility needs (5.3%, n = 1) (Table 3).

In our analysis of DRS scores, most respondents (61.4%, n = 35) reported no regret regarding preoperative FP or family-building choices after GAS. However, 22.8% (n = 13) and 15.8% (n = 9) reported mild and moderate-to-severe regret, respectively. DRS scores ranged from a minimum of 0 (no regret) to a maximum of 85 (severe regret). The median (interquartile range [IQR]) DRS scores among respondents who reported no regret, mild, and moderate-to-severe regret were 0 [0], 10.8 [5–15], and 50 [40–55], respectively (Table 4).

When examining factors selected a priori and their possible association with DRS scores, a statistically significant difference in median DRS scores was observed on the basis of a patient-reported adequacy of preoperative counseling regarding implications of surgery on future fertility or family-building (0 vs. 50,  $P = .001$ ) and FP options (0 vs. 12.5,  $P = .006$ ) (Supplemental Table 2). Respondents who experienced moderate-to-severe regret more frequently reported inadequacy of preoperative fertility or family-building (55.6% vs. 15.4% vs. 5.9%) and FP treatment counseling (55.6% vs. 33.3% vs. 14.7%) compared with those who experienced mild and no regret (Table 2). No significant

TABLE 2

Survey responses among all survey respondents and by severity of reported regret.

Survey questions and responses	Total (N = 57)	No regret (N = 35)	Mild regret (N = 13)	Moderate/severe regret (N = 9)
<b>Did you receive fertility or future family-building counseling from any medical provider before undergoing gender-affirming surgery?</b>				
Yes	17 (29.8)	15 (42.9)	2 (15.4)	0
No	32 (56.1)	17 (48.6)	8 (61.5)	7 (77.8)
Unsure or do not remember	8 (14.0)	3 (8.6)	3 (23.1)	2 (22.2)
<b>Were you offered a referral to REI or a fertility specialist to discuss fertility preservation or future family-building options?</b>				
Yes	20 (35.1)	14 (40.0)	4 (30.8)	2 (22.2)
No	29 (50.9)	17 (48.6)	6 (46.2)	6 (66.7)
Unsure or do not remember	8 (14.0)	4 (11.4)	3 (23.1)	1 (11.1)
<b>Did you accept a referral to a REI or fertility specialist to discuss fertility preservation or family-building options?</b>				
Accepted	1 (5.0)	1 (7.1)	0	0
Declined	19 (95.0)	13 (92.9)	4 (100.0)	2 (100.0)
<b>Did you go to your appointment with a REI or fertility specialist after accepting a referral?</b>				
Yes	1 (100.0)	1 (100.0)	—	—
No	0	0	—	—
<b>Did you choose to receive any fertility preservation treatment?</b>				
Yes	0	0	—	—
No	1 (100.0)	1 (100.0)	—	—
Unsure or do not remember	0	0	—	—
<b>Did you believe implications of gender-affirming surgery on future fertility or family-building were discussed adequately with you before undergoing your procedure?</b>				
Yes	47 (83.9)	32 (94.1)	11 (84.6)	4 (44.4)
No	9 (16.1)	2 (5.9)	2 (15.4)	5 (55.6)
Missing	1	1	0	0
<b>Did you believe fertility preservation options (e.g., egg, sperm, or embryo banking) were discussed adequately with you?</b>				
Yes	41 (74.6)	29 (85.3)	8 (66.7)	4 (44.4)
No	14 (25.4)	5 (14.7)	4 (33.3)	5 (55.6)
Missing	2	1	1	0
<b>Did you undergo removal of your ovaries at the time your uterus was removed?</b>				
Yes—Ovaries were removed	45 (79.0)	30 (85.7)	9 (69.2)	6 (66.7)
No—Ovaries were not removed	12 (21.0)	5 (14.3)	4 (30.8)	3 (33.3)

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TABLE 2

Continued.

Survey questions and responses	Total (N = 57)	No regret (N = 35)	Mild regret (N = 13)	Moderate/severe regret (N = 9)
<b>Before undergoing gender-affirming surgery, how important was future fertility or family-building for you?</b>				
Not at all important	33 (57.9)	26 (74.3)	7 (53.9)	0
Somewhat important	8 (14.0)	3 (8.6)	2 (15.4)	3 (33.3)
Neutral	8 (14.0)	4 (11.4)	3 (23.1)	1 (11.1)
Important	4 (7.0)	1 (2.9)	0	3 (33.3)
Very important	4 (7.0)	1 (2.9)	1 (7.7)	2 (22.2)
<b>How important is future fertility or family-building for you today?</b>				
Not at all important	35 (61.4)	27 (77.1)	7 (53.9)	1 (11.1)
Somewhat important	5 (8.8)	2 (5.7)	2 (15.4)	1 (11.1)
Neutral	5 (8.8)	3 (8.6)	2 (15.4)	0
Important	7 (12.3)	2 (5.7)	1 (7.7)	4 (44.4)
Very important	5 (8.8)	1 (2.9)	1 (7.7)	3 (33.3)

Note: REI = reproductive endocrinology and infertility.

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associations between severity of regret and age at time of surgery, time since surgery, pregnancy history, or acceptance of a referral to REI consultation were observed. A Kruskal-Wallis test was conducted to examine differences in median DRS scores on the basis of patient-reported importance of preoperative and current fertility or family-building options. A statistically significant difference in median DRS scores was found among the five importance ratings (not at all important, somewhat important, neutral, important, and very important) before surgery [ $\chi^2(4) = 13.948, P = .0011$ ] and at the time of survey completion [ $\chi^2(4) = 14.172, P = .0010$ ] (Supplemental Table 2).

## DISCUSSION

Among TGGNB persons having undergone GAS or removal of reproductive organs, mild-to-severe DR regarding preoperative FP decisions was reported by 38.6% of survey respondents on the basis of DRS scores. Patient-reported inadequacy of preoperative counseling regarding implications of surgery on future fertility or family-building as well as discussion of FP options were associated with higher median DRS scores.

In our analysis of patients experiencing DR, those who experienced moderate-to-severe regret were more likely to report inadequate preoperative counseling regarding future fertility or family-building and FP treatment options compared with those who experienced mild or no regret. No significant associations between the severity of regret reported and other factors, such as the age at which surgery was performed, time since surgery, or previous history of pregnancy, were found.

These findings highlight the importance of ensuring TGGNB persons are provided comprehensive, patient-

centered fertility counseling and a referral to REI consultation when indicated before undergoing GAS or removal of reproductive organs to reduce the risk of future DR. The receipt of fertility counseling has been shown to decrease future regret experienced by patients making medical treatment decisions and improve posttreatment quality of life (7, 27, 28). Among the reported literature, rates of FP counseling provided to transgender persons before gender dysphoria treatment have varied widely, ranging from 13.5% to 100.0%, with use of FP treatment over the last 10 years overall remaining low (2%–4%) (23). Despite 100% of survey respondents within our study having preoperative fertility counseling documented in their medical records, only 29.8% of respondents reported having received counseling. A similar discrepancy between provider-documented and patient-reported discussion of a referral to REI consultation was observed (96.5% vs. 35.1%). Given the retrospective nature of our study design, these results may have been subject to recall bias. More importantly, however, these discrepancies highlight a gap between provider and patient perceptions of adequate fertility counseling. Significant opportunities therefore exist to improve provider counseling to ensure individualized, patient-perceived satisfactory counseling and appropriate treatment options are provided. Potential strategies to improve the adequacy of counseling could include the development of decisional aid tools, the use of which has been shown to increase FP knowledge and decrease DR in patients with cancer (29). Patients considering FP may also benefit from peer support groups, whereby experiences and perspectives regarding GAS and FP choices could be discussed. These and other methods to improve patient-perceived adequacy of counseling should continue to be investigated and implemented in clinical practice.

**TABLE 3**

**Factors leading to declining a reproductive endocrinology and infertility referral among those offered an reproductive endocrinology and infertility referral (n = 19).**

Factors	n (%)
No desire for future fertility at the time	13 (68.4)
No desire for biologic children but consideration of or plan for future adoption	10 (52.6)
Cost of fertility treatment	5 (26.3)
Lack of insurance coverage for fertility care	3 (15.8)
Concern regarding stopping gender-affirming medications to pursue fertility preservation	6 (31.6)
Invasiveness of fertility preservation procedures	3 (15.8)
Concern regarding worsening gender dysphoria with future pregnancy	6 (31.6)
Planned for partner to assume fertility needs	1 (5.3)
Other	3 (15.8)

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Despite preoperative fertility counseling, referral to REI consultation for additional FP counseling was declined by nearly all survey respondents, based both on provider-documented and patient-reported referral decisions. Only one survey respondent reported accepting a referral to REI consultation but ultimately declining FP treatment. The most commonly reported reason for declining a referral was “no desire for future fertility” at the time of surgery (68.4%). These findings are consistent with previously reported barriers to and low rates of FP treatment use among TGGNB persons, particularly among TGGNB youth and adolescents (26, 30, 31). Avoidance of health care services related to concerns regarding discrimination, transphobia, harassment, and lack of experience or expertise in caring for LGBTQIA+ persons among providers and clinic staff have been reported by and may contribute to low use of FP treatments by this population (15). Additionally, TGGNB adolescents and those within peak reproductive years may understandably prioritize treatment of gender dysphoria through medical and/or surgical means over FP. Among our study population, approximately 32% of survey respondents

reported concerns regarding stopping or delaying gender-affirming medication to pursue FP. With treatment of gender dysphoria, however, changes in family-building desires may occur. TGGNB persons may also experience common, age-related changes in family-building desires because of changes in relationship status, financial capabilities, or other lifestyle factors affecting the ability to support a family. In our assessment of the presurgery and postsurgery (at the time of survey completion) importance of future fertility or family-building, a 75% and 25% increase in respondents reporting future fertility or family-building as “important” or “very important,” respectively, was observed, suggesting shifting attitudes toward fertility or family-building with time since surgery. The possibility of this change in attitude toward and potential desire for fertility or family-building options, as well as the associated risk of DR, should therefore be a component of comprehensive, individualized counseling for TGGNB persons considering GAS.

This temporal shift in attitudes toward fertility or family-building is important to consider when evaluating DR related to FP choices and should be addressed in future study designs investigating this topic. As evidenced by studies evaluating DR in other patient populations (e.g., patients with oncofertility, patients having undergone hysterectomy and/or oophorectomy for benign or malignant indications), the time at which DR is first experienced after medical treatment decisions may vary. Among young adult female cancer survivors, DR regarding FP was reported as soon as 1 year but as late as approximately 10 years after treatment, whereas in patients having undergone benign hysterectomy, DR was reported as early as 1 year and as late as 3 years after surgery (1, 27). These differences highlight the potential impact of follow-up times on study conclusions. Our study’s median follow-up time was 2.4 years (range 50 days to 6.7 years), and to our knowledge, this is the longest follow-up time evaluating DR in TGGNB persons currently reported in the literature. Although we identify this as a strength of our study, we also recognized that this follow-up period length may still be inadequate to identify the development of DR, which highlights the importance of future prospective research studies on this topic.

To our knowledge, this is the first study to examine DR specifically among TGGNB persons who have already undergone GAS or the removal of reproductive organs. This aspect of our study design is important as the use of the DRS has been validated in only those patients who have already made a medical decision (whereas the use of the decisional conflict scale is more appropriate for patients still considering a medical decision) (32, 33). As one of the limited studies examining DR among TGGNB persons, Vyas et al. (26) previously reported mild-to-severe DR regarding the decision to pursue FP among TG or gender-diverse persons responding to a follow-up survey after initial intake to their Gender Health Program. Survey respondents, however, included those still considering or not yet having decided to pursue FP. As noted by the study investigators, the results of the DRS in this population may be difficult to interpret and may be better analyzed with the administration of the decisional conflict scale. In addition, whether respondents had initiated or completed gender-affirming treatment was not specified

**TABLE 4**

**Decisional regret regarding preoperative fertility preservation and family-building choices after gender-affirming surgery as well as the removal of reproductive organs.**

Decisional regret scale <sup>a</sup>	No. (% , median score [IQR], range)
No regret	35 (61.4, 0, 0)
Mild regret	13 (22.8, 10.8 [5–15], 5–20)
Moderate-to-severe regret	9 (15.8, 50 [40–55], 25–85)

Note: IQR = interquartile range.

<sup>a</sup> Score 0 = no regret, 1–24 = mild regret, ≥25 = moderate-to-severe regret

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among the study results (26). Our study therefore represents the first to report the prevalence of DR among TGGNB persons with appropriate use of the DRS exclusively after a treatment decision (i.e., decision to pursue FP before GAS or removal of reproductive organs) and thus serves as a more accurate assessment of DR related to fertility preservation choices experienced by the TGGNB population.

Limitations of our study include its retrospective, cross-sectional study design. As previously discussed, the onset and severity of DR may vary among individuals in the time after a medical treatment decision. Administration of our survey at our selected time point may have resulted in responses from patients not yet experiencing DR because of static fertility or family-building desires or because they were too close to the timing of their medical treatment and FP decision to develop DR, limiting our ability to assess the true prevalence of DR. The potential for recall and/or selection bias on the basis of the retrospective, cross-sectional design of our survey study may also limit our conclusions. Additionally, as a single-site study, our standardized clinic protocol resulted in high rates of provider-documented fertility counseling and discussion of referral to REI consultation. We felt this variable would be less subject to recall bias compared with patient-reported receipt of fertility counseling in our assessment of receipt of fertility counseling and risk of DR (although, as previously discussed, patient-perceived adequacy of fertility counseling should be ensured before surgery). The high rate of provider-documented counseling, however, limited our ability to assess an association between a lack of counseling and the risk of DR. These limitations speak to the importance of future prospective, multisite studies investigating the prevalence of DR after GAS and its association with preoperative fertility counseling and FP treatments.

## CONCLUSION

Decisional regret regarding preoperative FP choices is experienced by TGGNB persons after GAS or the removal of reproductive organs. The risk of regret can be mitigated through the provision of preoperative fertility counseling and, when indicated, referral to REI consultation for additional discussion of FP options. In light of decreasing access to gender-affirming care secondary to increasing transdiscriminatory legislation across the country, every effort should be made to provide comprehensive care to TGGNB persons. This care should include patient-centered fertility counseling and equitable access to family-building options and should be the focus of future clinical practice and public policy changes.

## CRedit Authorship Contribution Statement

**Austin Johnson:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Asha B. McClurg:** Writing – review & editing, Methodology, Conceptualization. **Janine Baldino:** Data curation. **Rajeshree Das:** Data curation. **Erin T. Carey:** Writing – review & editing, Methodology, Conceptualization.

## Declaration of Interests

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