



# Selecting a chest masculinization plastic surgeon: a survey of transgender patients

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## Abstract

**Background** Chest masculinization is a commonly performed gender-affirming procedure in transmasculine and non-binary patients and has increased in prevalence in recent years despite continued barriers to surgical care. With the expansion of insurance coverage and trained surgeons, patients at times have the opportunity to be selective in choosing their gender-affirming surgeon. This study aimed to investigate factors that transmasculine individuals consider important when selecting their chest masculinization plastic surgeon.

**Methods** All patients who underwent chest masculinization with a single surgeon between January 2018 and December 2021 were surveyed via an online questionnaire to rate 21 factors associated with surgeon selection. Multiple-choice questions and free text space were included to further clarify patient preferences. Results were analyzed to rate factors in order of importance.

**Results** One hundred three individuals completed the survey, generating a response rate of 49.5%. Average patient age at time of surgery was 27.0 years, and 2.0% of patients had prior gender affirmation surgery (GAS). The top five most important factors were surgeon specialization in GAS, insurance coverage, board certification, number of times surgeon has performed procedure, and availability of Before and After photographs. The five least important factors were age of surgeon, medical publications, availability of YouTube videos, location of training, and surgeon presence on social media.

**Conclusions** Transmasculine patients employ distinct criteria when selecting a chest masculinization gender-affirming plastic surgeon. An improved understanding of these factors informs providers of ways to enhance patient access to information and gender-affirming care.

Level of evidence: Not gradable.

**Keywords** Transgender · Gender dysphoria · Chest masculinization · Patient preference

## Introduction

Gender-affirmation surgery (GAS) has been shown to significantly improve transgender individuals' gender dysphoria, physical and psychosocial well-being, and overall quality of life (QOL) [1]. While the Affordable Care Act of 2010, which expanded insurance coverage for GAS, has led to significant increases in the number of surgeries performed and providers offering these procedures, there is still a surplus of patients seeking surgical treatment while transitioning [2, 3]. This increased coverage, better societal acceptance, support among and for the transgender community, and other factors, has resulted in the number of patients seeking GAS to triple between 2000 and 2014 [2, 3].

One dilemma that patients with gender dysphoria face now is how to find and select the right surgeon for a given

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procedure. Access to the ideal surgeon for a given individual patient is challenging. There are currently only 660 surgeons who perform GAS across the USA, mostly plastic surgeons, to care for the over one million estimated patients with gender dysphoria [4, 5]. One must also navigate issues such as the geographical constraints on surgeon availability, long waiting lists for surgical consultations and/or surgical time, varying insurance coverage, and finding a surgeon one can truly entrust such a highly personal and life-altering procedure [4, 6, 7]. Furthermore, patients with gender dysphoria have long faced societal and institutional discrimination, and while transgender community support groups are generally supportive, it is still very challenging to find helpful resources to guide surgeon selection [7].

From the surgeons' perspective, understanding what factors influence a patient's decision to select as surgeon for GAS can help guide practice management and minimize barriers for patients to choose them as their surgeon. A prior survey of transfeminine individuals found patients to place most importance on surgeon's skills and location; it also reported that surgeon choice was heavily influenced by recommendations from trusted medical or mental health professionals as well as surgeon websites [8]. Other surveys among patients seeking plastic surgery highlight emphasis on surgeon reputation, board certification, referrals, and distance from home, with little preference for surgeon age and advertising [6, 9]. Broad surveys across many surgical specialties reiterate the importance of surgeon reputation, competency, and interpersonal skills, as well as referral from peers and other physicians when selecting a surgeon [10].

Though these categories of selection criteria have been explored in many patient populations, factors specifically important to transmasculine and non-binary individuals seeking GAS have not been assessed in detail. For this patient population, chest masculinization is commonly the first, and sometimes only, GAS patients will undergo [11]. The goal of this study is to determine what surgeon- and practice-specific factors patients seeking chest masculinization surgery consider most important when selecting a gender-affirming plastic surgeon. Assessing patient preferences in this patient cohort can help elucidate specific barriers to care and enhance access as well as improve care for individuals affirming their gender through chest masculinization.

## Methods

### Study design and patient selection

A cross-sectional study of all consecutive patients who underwent chest masculinization with the senior author between January 2018 and December 2021 was performed via a patient survey. Any patient who underwent chest masculinization

surgery, as defined as any patient seeking gender-affirming care in the form of a subcutaneous simple mastectomy with free nipple grafting or preservation of the nipple areolar complex on a dermoglandular pedicle, was eligible for the survey. All patients met criteria for the World Professional Association for Transgender Health (WPATH) standards of care for gender-affirming surgery at the time of procedure.

### Survey development and administration

Following institutional review board approval, a survey was designed to assess patient preferences when selecting a chest masculinization plastic surgeon. No validated questionnaire exists on this topic for the chest masculinization patient population; therefore, questions were generated based on previously described surveys of patients in multiple medical fields, both transgender and cisgender [8, 12–14]. We selected 21 factors to assess importance to patients when selecting chest masculinization surgeon based on our review of other surveys; these included surgeon qualities such as age and education, surgical center characteristics such as hospital reputation, and patient elements such as insurance status. Patients rated each factor on a scale of 0 to 10, where 0 indicated not important and 10 indicated most important. Multiple-choice questions were also included to expand on various factors and collect self-reported patient demographic information. A free text space was included to allow patients to provide any additional input, as the transgender experience is personal and unique.

Patients were emailed the link to the online questionnaire, utilizing the Qualtrics survey platform. Responses were anonymous, and patients were allowed to defer any question they chose not to answer.

### Survey analysis

Frequencies of responses for patient demographic questions were totaled. The range, average rating, and standard deviation for each factor rating were calculated. Multiple-choice answer frequencies were assessed. Qualitative responses were analyzed and summarized into commonly recurring themes. Statistical analysis was performed using STATA v.15 (StataCorp, College Station, Texas).

## Results

Two hundred eight patients who underwent chest masculinization surgery were contacted with the link to the online survey. One hundred three individuals completed the survey, resulting in a response rate of 49.5%.

## Patient demographics

Demographic data and other patient characteristics are displayed in Table 1. The average patient age at the time of surgery was 27.0 years, with a mean of 4.0 years from the age of starting the process of gender affirmation to undergoing chest masculinization. Only 2 patients (2.0%) had prior gender affirmation surgery. Race and ethnicity data was self-reported as white in 51.0% of respondents. Most of the surveyed patients (54.9%) had median income of less than US\$50,000, and the majority (68.0%) had private health insurance; no patients were uninsured. The highest level of education was either college or graduate degree in 51.5% of respondents, and 71.8% were employed either part- or full-time.

## Quantitative data

Average ratings of factors on a scale of 0 to 10 to assess importance when selecting a chest masculinization plastic surgeon are listed in Table 2, from most to least important. The five most important factors were that the surgeon specializes in GAS, the surgeon is in insurance network, board certification, the number of times the surgeon has performed the procedure, and the availability of Before and After photographs, respectively. The five least important factors were found to be the age of surgeon, number of medical publications by the surgeon, availability of YouTube videos, location of medical school and training of the surgeon, and surgeon presence on social media.

Table 3 displays more details regarding specific factors that respondents were asked in multiple-choice format. There was no consensus regarding the oldest age of surgeon preferred by patients; however, 92.9% preferred surgeons to be no younger than 30 or 35 years of age. Nearly 40% of patients would consider seeking a different plastic surgeon if there was no appointment availability for 8 or more weeks. The majority of patients (81.0%) would be willing to travel greater than 1 h to see a surgeon, and 36.6% would be willing to wait greater than 3 months to schedule surgery. Approximately half of patients preferred their surgeon to have greater than 6 years of experience and to have performed chest masculinization surgery more than 50 times.

When seeking a chest masculinization surgeon, 50.5% only consulted with the senior author, while the remainder consulted two or more surgeons. The majority of patients found their chest masculinization surgeon by referral from another physician or mental health professional, online search, or referral from family or friends (Table 3).

**Table 1** Patient demographics and characteristics

| Demographic   | n = 103      |
|---|--------------|
| Age, years  |              |
| At start of gender affirmation process  | 22.80 ± 7.32 |
| At time of chest masculinization surgery  | 26.97 ± 7.18 |
| Time from start of gender affirmation process to chest masculinization surgery, years | 4.02 ± 3.51  |
| Previous gender affirmation surgery   | 2 (1.98%)    |
| Median household income, US\$   |              |
| Less than \$25,000  | 31 (30.39%)  |
| \$25,000 to \$50,000  | 25 (24.51%)  |
| \$50,000 to \$75,000  | 18 (17.65%)  |
| \$75,000 to \$100,000   | 13 (12.75%)  |
| \$100,000 to \$150,000  | 6 (5.88%)    |
| \$150,000 to \$200,000  | 8 (7.84%)    |
| \$200,000 to \$300,000  | 0 (0.00%)    |
| Greater than \$300,000  | 1 (0.98%)    |
| Insurance   |              |
| Private Insurance: PPO  | 53 (51.46%)  |
| Private Insurance: HMO  | 17 (16.50%)  |
| Medicaid  | 8 (7.77%)    |
| Medicare  | 25 (24.27%)  |
| Self-pay  | 0 (0.00%)    |
| Highest level of education  |              |
| Some high school  | 3 (2.91%)    |
| High school diploma   | 19 (18.45%)  |
| Technical/trade school  | 1 (0.97%)    |
| Some college  | 27 (26.21%)  |
| College degree  | 34 (33.01%)  |
| Graduate degree   | 19 (18.45%)  |
| Employment status   |              |
| Not employed  | 12 (11.65%)  |
| Student   | 23 (22.33%)  |
| Part-time employee  | 14 (13.59%)  |
| Full-time employee  | 51 (49.51%)  |
| Disabled  | 3 (2.91%)    |
| Retired   | 0 (0.00%)    |
| Race and ethnicity  |              |
| White   | 52 (50.98%)  |
| Black or African American   | 24 (23.53%)  |
| American Indian or Alaska Native  | 0 (0.00%)    |
| Asian   | 0 (0.00%)    |
| Native Hawaiian or Other Pacific Islander   | 0 (0.00%)    |
| Hispanic or Latino  | 13 (12.75%)  |
| Multiracial   | 10 (9.80%)   |
| Other   | 2 (2.94%)    |

## Qualitative data

Commonly recurring themes of patient preference reported by respondents in the free text space are displayed in

**Table 2** Rating of factors that impact selection of plastic surgeon

| Question  | Average rating (0–10) | Std. dev | Range (0–10) |
|---|-----------------------|----------|--------------|
| 1. Surgeon specializes in gender affirming surgery  | 9.85                  | 0.51     | 6–10         |
| 2. Surgeon is within insurance network  | 9.55                  | 1.40     | 0–10         |
| 3. Surgeon is a board-certified surgeon   | 9.44                  | 1.42     | 1–10         |
| 4. Number of times surgeon has performed chest masculinization surgery                    | 9.02                  | 1.46     | 2–10         |
| 5. Availability of Before and After photographs   | 8.91                  | 2.05     | 0–10         |
| 6. Surgeon bedside manner   | 8.81                  | 2.00     | 1–10         |
| 7. Surgeon is a member of WPATH (World Professional Association for Transgender Health)   | 8.60                  | 2.22     | 1–10         |
| 8. Online patient satisfaction reviews (healthgrades.com, yelp.com, Google reviews, etc.) | 8.37                  | 2.36     | 0–10         |
| 9. Customer service and availability of office staff                                      | 8.31                  | 2.22     | 0–10         |
| 10. Appearance/atmosphere of clinic and hospital facilities                               | 7.75                  | 2.30     | 0–10         |
| 11. Reputation of hospital  | 7.61                  | 2.29     | 2–10         |
| 12. Number of years surgeon has been in practice  | 7.44                  | 2.46     | 0–10         |
| 13. Referral from primary care physician, other physician, or mental health professional  | 7.34                  | 2.62     | 0–10         |
| 14. Appearance of surgeon's website   | 7.15                  | 2.53     | 0–10         |
| 15. Distance of surgeon from your home  | 7.05                  | 2.70     | 0–10         |
| 16. Recommendation by family member or friend   | 6.47                  | 3.30     | 0–10         |
| 17. Surgeon presence on social media (Facebook, Instagram, Twitter, etc.)                 | 6.15                  | 3.26     | 0–10         |
| 18. Location of medical school, residency, and fellowship training of surgeon             | 5.72                  | 3.15     | 0–10         |
| 19. Availability of YouTube videos by surgeon   | 5.47                  | 3.35     | 0–10         |
| 20. Number of medical publications by surgeon   | 3.90                  | 3.19     | 0–10         |
| 21. Age of surgeon  | 3.88                  | 3.02     | 0–10         |

Table 4. These themes included surgeon reputation within the transgender community, surgeon experience with diverse persons of color (POC), cultural competency of office staff, body mass index (BMI) limitations, and costs.

## Discussion

Chest masculinization is increasingly performed with successful results; however, patients still face significant barriers in obtaining this critical step in transgender care [15, 16]. Despite this procedure often being the initial and sometimes only surgery transmasculine and non-binary patients pursue, limitations have precluded individuals from exploring their options and preferences for GAS surgeons [7, 11].

The results of this questionnaire reveal reasons transmasculine patients select certain surgeons and what criteria they employ while seeking gender affirming care. This patient cohort surveyed placed importance on surgeons who specialize in GAS, are within their insurance network, have performed chest masculinization many times, and provide adequate Before and After photographs. These findings emphasize ways in which surgeons can improve their accessibility — and appeal — to patients, particularly by updating their website content as well as information given at consultation. Explicit, easy-to-understand information

regarding surgeon specialization and experience is critical for prospective patients to identify providers with whom they are interested in seeking treatment from. Both on surgeons' websites and within the initial consultation-specific training and specialization in GAS should be denoted, articles and presentations establishing the surgeon as an expert in GAS should be listed, and surgeons should have diverse Before and After photographs highlighted on their website and on hand during consultation. Furthermore, staff should prioritize asking patients about insurance and investigating if they are in-network and inquire if they would like an appointment out-of-network or with another GAS provider.

Interestingly, factors that were deemed least important included surgeon age, number of medical publications, location of training, and use of social media. Though most of our patients preferred their surgeon to be 30 to 35 years or older, overall, there was low preference for surgeon age which concurs with prior surveys within orthopedic surgery patients and patients seeking esthetic plastic surgery [9, 13]. Additionally, despite increasing social media use by patients within the field of plastic surgery to seek providers, it is not surprising that the transgender community is not as reliant on social media for this purpose [17]. Less than 1% of posts on Instagram, for example, by professional plastic surgery organizations portray transgender patients or procedures, likely contributing to the lack of dependence on this type

**Table 3** Additional questions on factors affecting surgeon selection

| Question  | Response    |
|---|-------------|
| Preferred oldest age of plastic surgeon   |             |
| <i>45 years old</i>   | 9 (9.38%)   |
| <i>50 years old</i>   | 12 (12.50%) |
| <i>55 years old</i>   | 21 (21.88%) |
| <i>60 years old</i>   | 19 (19.79%) |
| <i>65 years old</i>   | 23 (23.96%) |
| <i>70+ years old</i>  | 12 (12.50%) |
| Preferred youngest age of plastic surgeon   |             |
| <i>30 years old or younger</i>  | 45 (45.92%) |
| <i>35 years old</i>   | 46 (46.94%) |
| <i>40 years old</i>   | 6 (6.12%)   |
| <i>45 years old</i>   | 0 (0.00%)   |
| <i>50 years old</i>   | 1 (1.02%)   |
| <i>55+ years old</i>  | 0 (0.00%)   |
| Appointment availability to consider seeking a different plastic surgeon              |             |
| <i>No appointment for 2 weeks</i>   | 2 (2.02%)   |
| <i>No appointment for 4 weeks</i>   | 9 (9.09%)   |
| <i>No appointment for 6 weeks</i>   | 14 (14.14%) |
| <i>No appointment for 8+ weeks</i>  | 39 (39.39%) |
| <i>Does not matter</i>  | 35 (35.35%) |
| Longest time willing to travel to see a surgeon                                       |             |
| <i>Less than 15 min</i>   | 1 (1.00%)   |
| <i>15 to 30 min</i>   | 4 (4.00%)   |
| <i>30 min to 1 h</i>  | 14 (14.00%) |
| <i>1 h to 2 h</i>   | 41 (41.00%) |
| <i>Greater than 2 h</i>   | 40 (40.00%) |
| Longest time willing to wait to schedule surgery                                      |             |
| <i>Less than 2 weeks</i>  | 2 (1.98%)   |
| <i>2 to 4 weeks</i>   | 5 (4.95%)   |
| <i>1 to 3 months</i>  | 57 (56.43%) |
| <i>Greater than 3 months</i>  | 37 (36.63%) |
| Preferred years of experience of surgeon  |             |
| <i>1 to 2 years</i>   | 1 (1.01%)   |
| <i>3 to 5 years</i>   | 38 (38.38%) |
| <i>6 to 10 years</i>  | 46 (46.46%) |
| <i>Greater than 10 years</i>  | 5 (5.05%)   |
| <i>Does not matter</i>  | 9 (9.09%)   |
| Preferred number of times for surgeon to have performed chest masculinization surgery |             |
| <i>10 times</i>   | 7 (7.00%)   |
| <i>25 times</i>   | 28 (28.00%) |
| <i>50 times</i>   | 33 (33.00%) |
| <i>100 times</i>  | 26 (26.00%) |
| <i>Does not matter</i>  | 6 (6.00%)   |
| Number of surgeons consulted before surgery   |             |
| <i>1</i>  | 50 (50.51%) |
| <i>2</i>  | 32 (32.32%) |
| <i>3</i>  | 15 (15.15%) |
| <i>4+</i>   | 2 (2.02%)   |
| How patient found chest masculinization surgeon                                       |             |
| <i>Referral from PCP, other physician, or mental health professional</i>              | 36 (35.64%) |
| <i>Online search</i>  | 37 (36.63%) |

**Table 3** (continued)

| Question                              | Response    |
|---------------------------------------|-------------|
| <i>Referral from family or friend</i> | 20 (19.80%) |
| <i>Social media</i>                   | 5 (4.95%)   |
| <i>Insurance in-network list</i>      | 3 (2.97%)   |

**Table 4** Common themes of other important factors

| Theme  | Responses   |
|--|---|
| Reputation within the transgender community                        | <i>“reputation... within the trans community”; “word of mouth in trans community”; “experience with LGBT community”</i>   |
| Experience with persons of color (POC)                             | <i>“how many patients of color my surgeon has performed on;” “experience performing surgery on people of color;” “... wanted a POC surgeon;” “a plus if the surgeon was of color;” “variety in Race/Skin tone of before and after/result photos”</i>  |
| Transgender and gender non-conforming cultural competency of staff | <i>“non-binary friendly and affirming;” “use of proper pronouns by surgeon and staff;” “trans-affirming including non-binary and gender non-conforming persons;” “competency... beyond just health (i.e. using correct pronouns, understanding difficulty in accessing care... limitations in transitioning because of family...);” “support staff... were all respectful and knew a lot”</i> |
| BMI limitations  | <i>“taking me at the BMI that I was at the time of consultation;” “wouldn’t disqualify me because of my weight as chest dysphoria was... why I couldn’t exercise”</i>   |
| Costs  | <i>“cost of procedure through insurance;” “out of pocket cost even with insurance”</i>  |

POC persons of color; BMI body mass index

of media for information regarding gender-affirming chest masculinization [17].

Expectedly, word of mouth within the transgender community as well as referral from mental health and medical professionals played a significant role in patients’ selection of surgeon. Patients in general rely heavily on family, peers, or their primary care practitioners to select physicians for their care [18]. In a survey of plastic surgery patients, nearly one-quarter reported method of referral was the most important factor when seeking a surgeon; furthermore, GAS patients are more likely to pursue treatment with a provider based on the recommendation of a trusted medical professional whom they have worked with previously [6, 8]. This maintains the importance of professional and mutually beneficial relationships with referring providers, good patient rapport, and delivering good surgical outcomes. We also found that patients were willing to wait greater than 1 to 3 months to undergo surgery with a physician of their choosing; similar findings have been observed among patients undergoing joint replacement surgery who would wait even longer for a visit with a reputable surgeon [19].

Though not explicitly surveyed through our questionnaire, our results unveiled repeating themes of the importance of cultural competency of office staff, experience with racially and ethnically diverse patients, and acceptance of patients with a higher body mass index (BMI) when patients were seeking their surgeon. A lack of cultural competency with transgender and gender non-conforming populations is frequently a barrier to care [20]. This form of competency

is not just limited to use of correct pronouns and knowledge of GAS; it extends to overall understanding of transgender issues including social issues, other healthcare barriers, and stigmatization both within and outside of the healthcare setting [20, 21]. Transgender patients may use alternate language to describe their body parts, have diverse health needs, and utilize unique social support systems [21]. Interpersonal skills in general, not just limited to transgender patients, are very important in selecting surgeons in all specialties, as many of our patients described [10].

Experience with diverse patients, including racial and body type, was noted by multiple respondents as a factor that influenced their choice of surgeon. Though some patient surveys have revealed no provider racial preference in the majority of patients, other studies have shown that certain cohorts of patients were more likely to believe a racially concordant surgeon would provide them better results [12, 22]. Furthermore, African American patients may be more likely to travel greater than 100 miles for an esthetic plastic surgeon who shared their race [22]. Exposure to diverse patients as well as displaying Before and After photographs that reflect these underrepresented patient populations may aid patients in identifying surgeons experienced with various patient populations. This is especially important in urban areas which may have populations of nonwhite individuals greater than 50 to 60% [23]. Multiple respondents also noted difficulty in finding surgeons who would accept their BMI prior to undergoing chest masculinization. Obese patients have historically been denied this procedure due to concern



for increased complications [24]. However, a recent study of patients with an average BMI greater than 39 kg/m<sup>2</sup> who underwent chest masculinization revealed excellent results: no returns to the operating room, high satisfaction, and a total nipple graft loss rate of only 6% [24].

Improving patient outreach and overall access to gender-affirming plastic surgeons can be accomplished by focusing on the major themes revealed by this survey as well as the availability of knowledgeable, board-certified providers, whom are currently in a deficit [20]. There is a demand for increased exposure to GAS during residency training, as well as number of fellowship positions; a survey of program directors in 2020 revealed the majority believe their trainees were prepared to address gender-affirming plastic surgery concerns, but only 26% of programs offered dedicated experience to transgender patients [25]. It is imperative to increase exposure during training, as over half of the patients in our survey preferred their surgeons to have performed this surgery greater than 50 to 100 times. A 2020 review of online directories only revealed 660 gender-affirming surgeons in the USA — stressing the country-wide shortage of specialized providers [4]. Among these limited providers exists a geographic distribution that does not match the distribution of transgender individuals [4]. Transgender and gender-non-conforming individuals are more likely to live in rural areas than cisgender individuals; however, plastic surgeons are heavily concentrated in urban areas [26]. These patients often must travel across states, even out of country, to find surgeons for chest masculinization; over 80% of our surveyed patients were willing to travel greater than 1 h of driving distance to access a provider [27]. Increasing both the number of GAS-trained providers as well as the geographic distribution of such surgeons will greatly advance access to care in this community.

Even as surgeons become more available to patients in terms of number and location, it is critical for patients to accurately and easily understand information in regard to these providers and surgical options so that they are able to make informed choices for their care [10]. The majority of patients are only comfortable pursuing treatment with surgeons who provide sufficient information on GAS either on their website or in person [7]. The internet is relied on heavily in this patient population; support communities, resources for gender identity terms, and information on transgender-friendly providers comprise a wide network online [28]. Yet, a survey of transgender individuals and their support systems revealed difficulty in finding adequate information about surgeon credentials and offered procedures, making it difficult to find providers or trust their experience [28]. As surgeon specialization, board certification, and overall experience with gender affirmation have been highlighted as important to patients, improving online presence and quality of information provided is of utmost

importance to increase reach to prospective patients. An area of online information that our survey suggests to be important to patients is the availability of diverse Before and After photographs; general plastic surgery social media lacks the inclusion of transgender photographs, emphasizing the need to better depict results and options for surgical procedures in transgender and gender-non-conforming individuals of all racial and ethnic backgrounds [17].

Insurance limitations still preclude individuals from undergoing GAS; the Affordable Care Act of 2010 increased the breadth of coverage which led to significant growth of gender-affirming care; however, there are still significant out-of-pocket costs associated with this procedure [2]. Insurance limitations also dictate what providers are available to patients, narrowing their ability to select surgeons that would be the best fit for their goals [2]. Additionally, uninsured transgender individuals face significant difficulty in obtaining care due to the high cost [2]. Continued improvements in insurance coverage as well as efforts to expand care to uninsured individuals will play a major role in increasing access and options among chest masculinization patients.

Finally, improvement in the cultural competency of providers and staff is always possible with the evolving understanding of how to best care for the transgender population. Continued education on the utilization of appropriate language on websites and social media as well as bedside manner is crucial in promoting safe, reliable environments for patients to successfully achieve chest masculinization. Surgeon–patient interactions in general are of utmost importance to patients in determining quality of care, despite the focus of surgeons on operative outcome measures [29].

Underlying the findings of this survey was the ongoing COVID-19 pandemic, which had a heightened impact on the transgender and non-binary patient population. Though the implications of the pandemic may take years to fully elucidate, it exacerbated healthcare-related disparities in this patient population [30]. Economic hardship in the early pandemic disproportionately affected transgender and gender non-conforming individuals nearly four times as frequently as the general population [31]. Furthermore, the freeze on all non-emergent surgery in early 2020 effectively halted all GAS; finding new clinicians whether for surgical care, primary care, or mental health also became substantially more difficult [30]. A large, multi-national study of the transgender and non-binary population revealed that half of individuals reported the pandemic restricted access to gender-affirming care, and 40% stated it negatively impacted their ability to live as their identified gender [32]. This sharp decline in care was associated with increased depression and suicidal ideation in those who reported decreased access, further emphasizing the need to strongly consider and dismantle the disparities this vulnerable patient population faces particularly during the pandemic [32].

Our study is limited in cohort size as well as patient population surveyed; all questionnaire respondents were patients of a single surgeon in an urban area. Our patients were all insured, most had at least a college or university education level, and most were employed. A more robust survey of varying patient populations is imperative to further specify patient preferences, as demographics such as education level may impact preferences for providers [12]. Furthermore, as this was a single-surgeon patient cohort, bias may exist in their preferences for surgeon details as the factors they rated as important may have led them specifically to choose the senior author for their surgical care. More robust surveys of patients from multiple surgeons and practices in various geographic areas will be needed to make our findings more generalizable to all transmasculine individuals. Additionally, our survey did not explicitly assess gender or race and ethnicity preferences nor discern differences in preferences between non-binary versus transmale individuals. A prior survey of transfeminine patients revealed no preference for gender-concordant surgeons; however it is unknown if this extends to the transmasculine population [8]. Future surveys among transmasculine and gender non-conforming patients should include questions specific to these preferences.

## Conclusions

Improving patient outreach and access to gender-affirming chest masculinization is a necessary goal in transgender healthcare. This survey unveiled various criteria transmasculine patients utilize when seeking GAS treatment with a plastic surgeon, emphasizing areas for potential improvement. Amplifying the availability of GAS providers through improved exposure during training and fellowship positions, reducing insurance limitations, and improving online information regarding surgeon background, procedures, and diverse Before and After photographs will enhance transmasculine patients' informed decision making when selecting their surgeon.

**Author contribution** All the authors contributed to the study design and conception. Material preparation was performed by Abigail R. Tirrell, Idanis M. Perez-Alvarez, Brian L. Chang, and Paige K. Dekker. Data collection and analysis was performed by Abigail R. Tirrell. The first draft of the manuscript was written by Abigail R. Tirrell. All the authors contributed to previous versions of the manuscript. All the authors read and approved the final manuscript.

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## Declarations

**Ethics approval** This study was given approval as "exempt" status by the Institutional Review Board of MedStar Health Research Institute on 1/13/2021 (MHRI 2021–3208).

**Consent to participate** Informed consent was obtained from all participants included in the study.

**Consent for publication** Consent to publish was obtained from all participants included in the study.

**Competing interests** Abigail R. Tirrell, Brian L. Chang, Idanis M. Perez-Alvarez, Paige K. Dekker, Kevin G. Kim, Kenneth L. Fan, and Gabriel Del Corral declare no competing interests.

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