

Physical Features Contributing to Gender Dysphoria: The Role of Voice

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Abstract

Objective. Features that cause gender incongruence (gender identity not aligning with assumptions based on sex assigned at birth) in transgender individuals often motivate them to seek out gender-affirming treatments. Voice has rarely been included as a major contributor to gender dysphoria. The primary objective of this study is to understand the significance of dysphoria related to voice compared to dysphoria secondary to other features.

Study Design. Prospective population-based survey study.

Setting. Social media.

Methods. The survey requested a ranking of features that contribute to gender dysphoria, whether the features were bothersome due to external or internal perception, and self-reported ideal order for pursuing gender-affirming treatments. The categories of features that were ranked included upper body, lower body, face, neck, voice, and height.

Results. In total, 79% of respondents experience gender incongruence secondary to their voice. Voice was the second most important feature contributing to gender dysphoria, only after upper body. In transgender men (29.4%) and transgender women (25%), voice was both the second most important feature contributing to gender dysphoria and the second most important intervention to alleviate gender dysphoria. Specifically, vocal incongruence is largely due to perception by others, as opposed to lower body which contributes to incongruence due to perception by self.

Conclusion. Voice is the second most common contributor to gender dysphoria after upper body. Due to self-rated importance of voice to gender incongruence, health care providers must be aware that voice interventions are critical to improve gender dysphoria experienced by transgender individuals.

Keywords

gender-affirming voice, gender dysphoria, gender incongruence, health equity, transgender health

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Introduction

Gender dysphoria refers to clinically significant distress or impairment in social, occupational, or other important areas of functioning secondary to gender incongruence.¹ It is associated with documented health disparities in the transgender and gender nonconforming (TGNC) community, such as poorer health outcomes, reduced access to health care, delayed access of health care, and higher rates of social stress and negative health behaviors.^{2–7} Gender-affirming health care has been shown to improve psychological distress and is associated with high levels of satisfaction and low rates of decisional regret.^{8,9} Accordingly, national rates of gender-affirming surgery have risen in the United States.¹⁰ The most common group of procedures are aimed at modifying the breast/chest region, genital reconstruction, and facial/cosmetic procedures.¹⁰

Voice has not traditionally been included as a domain of gender-affirming health care for transgender men (TGM) or transgender women (TGW), despite being recognized as a necessary component of gender-affirming health care by the World Professional Association for Transgender Health (WPATH).¹¹ Insurance coverage of voice-related interventions is also low,¹² especially when compared to other types of gender-affirming procedures such as chest masculinization, which was covered by 98% of companies in an insurance database study.¹³ However, due to our clinical experience and the importance of voice in identity,¹⁴ we suspect that voice plays a significant

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role in gender dysphoria. Therefore, the aim of this study is to characterize the following:

1. How voice contributes to gender dysphoria in TGNC individuals relative to other features.
2. In what order TGNC individuals would ideally seek out gender-affirming care.
3. If certain physical features cause dysphoria due to perception by others (external) or due to self-perception (internal).

Methods

To answer the research questions, we chose to create a population-based survey distributed online. The study was deemed exempt by the Mount Sinai Institutional Review Board. It was designed in collaboration with a researcher who is a member of the TGNC community. The survey contained four main components. The three main questions on the survey were as follows:

1. Which physical attributes are the greatest contributors to gender dysphoria?
2. In what order would transgender/nonbinary (NB) individuals prefer to seek gender-affirming treatment to best alleviate gender dysphoria (in an ideal world)?
3. For each feature, is gender dysphoria more influenced by self-perception or perception by others?

Participants were asked to rank physical features for questions 1 and 2. The features were grouped into the following categories: lower body (genitalia, hips, etc.), upper body (chest, shoulders, etc.), neck (Adam's apple, hair, etc.), voice, facial features (bone structure, hair, skin, etc.), and other (respondents could write in options). The features were selected to broadly reflect procedures undertaken by TGNC individuals rather than specific procedures that would generally only be selected by one group (eg, breast augmentation reflects a choice that is most likely only selected by TGW, whereas upper body/chest could reflect a choice made by respondents regardless of specific gender identity). The rankings data were used to calculate weighted scores. For each question, each feature received a weighted score incorporating both frequency of selection and priority in ranking. Features were assigned five points for a ranking of first place, four points for a ranking of second place, and so forth. No score was assigned for rankings below fifth place. Participants were allowed to select as many or as few features as desired, and rankings were calculated only for the number of features selected. If three features were selected as contributors to dysphoria, then they would only rank three (and weighted scores would be calculated with five points for first place, four points for second place, and three points for third place). If six features were

selected, they were asked to rank all six (and the sixth-place feature would receive a weighted score of zero). From the list of features that respondents listed as contributors to dysphoria, they were asked if there was a distinction between dysphoria due to perception by others or dysphoria due to perception by self. Respondents could also indicate that the two were equal. Wilcoxon one-sample tests were used to analyze the distribution of perception origin for each feature.

The survey was designed to capture a wide range of gender identities from the TGNC community rather than our clinic population, which is predominantly composed of TGW seeking voice feminization. Within the TGNC community, social media are widely used as a source of health information and information sharing.¹⁵⁻¹⁷ Therefore, the authors chose to distribute the survey on social media.

The survey was administered securely via REDCap. There were two main survey distribution methods: voice-affiliated (VA) social media and non-voice-affiliated (NVA) social media. For NVA social media, the survey was posted to general transgender pages on Reddit. In terms of VA social media, the survey was distributed by one author (A.C.G.) who is a speech-language pathologist (SLP) and maintains a social media presence related to his work as a TGNC equity educator. The sites included in VA social media were Instagram, Facebook, LinkedIn, and X (Twitter). Student's two-sided *t* test was used to compare mean voice ranking between VA and NVA social media sites.

Results

There were 119 respondents who fully completed the questionnaire and who were included in the analysis. Their gender identities were mainly NB (37%), TGM (29.4%), and TGW (25%). Individuals identifying as gender-fluid or "other" made up a small component ($n = 4$, $n = 6$, respectively). The overall data represent all respondents. When results are stratified by gender identity, only the TGM, TGW, and NB groups are included due to the small size of other groups in comparison. Other demographic data collected were a self-reported rating of progress in transition, with 0 representing "just starting" and 100 representing "finished" with my transition. The average rating of progress in transition was 49.4 (± 28.8) and a range was from 0 to 100. There were ten respondents whose self-reported progress in transition was less than 10, and seven respondents whose self-reported progress in transition was greater than 90.

Most respondents found the survey on Instagram (VA social media) (69.7%, $n = 83$). There was no statistically significant difference between mean voice ranking in responses from VA social media and responses from NVA social media ($P = .20$ for feature ranking, $P = .56$ for intervention ranking).

Overall, in nonweighted analysis, upper body, lower body, and voice were the three most common features contributing to gender dysphoria regardless of gender identity (**Table 1**). When stratified by gender identity, voice is tied for second most common cause of dysphoria among TGM (in 88.6% of TGM respondents), and third most common cause of dysphoria among NB respondents, cited in 67.4% of NB respondents. It was the fourth most common feature contributing to dysphoria in TGW, cited by 82.8% of TGW respondents.

The average number of features ranked was four features. Therefore, weighted scores were calculated for the top four highest-scoring features (**Figure 1**). When considering weighted score among all respondents, upper body was the most important feature contributing to dysphoria, receiving the highest weighted score (429 points, making up 30.4% of total weighted score across all respondents), followed by voice at second most important feature (324 points, 23.0% of total weighted score). Responses varied by gender identity, with voice being the second most important feature contributing to gender dysphoria for TGM and TGW after upper body for TGM and face for TGW.

Next, respondents were asked in what order they would like to seek gender-affirming treatment (in an ideal world). This question was theoretical, as most respondents had likely received some gender-affirming care and/or surgeries (based on an average self-reported rating of progress in transition of 49 out of 100). Overall, upper body was the most prioritized theoretical intervention, receiving the highest weighted score. Voice was the second most prioritized theoretical intervention. When separated by gender identity, the results varied slightly (**Figure 2**). In the NB cohort, voice was the third most important theoretical intervention. In TGM, voice was the second most important theoretical intervention to alleviate gender dysphoria after upper body, whereas in TGW, voice was the second most important intervention after facial features.

Regarding whether the attribute contributed to dysphoria due to self-perception or perception by others, the

average rating of lower body was significantly in favor of “self-perception” ($P = .0003$) and the average rating of voice was significantly in favor of “perception attributed to others” ($P < .0001$) (**Figure 3**). Face, neck, upper body, and height were not significantly skewed (**Table 2**). Details of perception for each feature with comparisons among gender identities can be found in **Table 2**. For voice specifically, “self-perception” was rarely cited as a cause for dysphoria (only 6.4% of respondents). Respondents who indicated that vocal incongruence was due to others’ perception prioritized voice as the most important intervention more frequently (32.4%) than those who indicated that perception was equal between self and others (27.7%).

Discussion

These results support that incongruence of voice with gender contributes significantly to the experience of gender dysphoria in TGNC individuals. Although features such as upper body and lower body were more frequent contributors to gender dysphoria, the ranking of voice as the second most important feature by TGM and TGW in gender dysphoria supports the need to address voice and communication-related gender incongruence. Further, the ranking of features contributing to dysphoria and the ranking of the ideal order of interventions to alleviate dysphoria were aligned. Respondents felt that voice congruence was a high-priority theoretical intervention in their transition which highlights the need to address issue of voice and communication early during the transition process. These results mirror the findings by Ziltzer et al, who evaluated areas of care in otolaryngology other than voice. These investigators found that higher ratings of gender dysphoria had a relationship with desire for related gender-affirming treatments.¹⁸

In clinical practice, individualized patient ratings of voice in relation to other physical features that are part of gender-affirming care can be used to direct patient-provider conversations about the order of interventions to optimize patient satisfaction and minimize gender dysphoria. For example, if the individual considers

Table 1. Self-reported Features That Contribute to Gender Dysphoria, by Gender Identity

	Overall n = 119	NB n = 44	TGM n = 35	TGW n = 30	GF n = 4	Other n = 6
Upper body, n (%)	107 (89.92)	38 (86.36)	34 (97.14)	26 (86.67)	4 (100)	5 (83.33)
Lower body, n (%)	97 (81.51)	31 (70.45)	31 (88.57)	28 (93.33)	3 (75)	4 (66.67)
Voice, n (%)	94 (78.99)	29 (65.91)	31 (88.57)	25 (83.33)	3 (75)	6 (100)
Face, n (%)	85 (71.43)	25 (56.82)	26 (74.29)	26 (86.67)	2 (50)	6 (100)
Height, n (%)	58 (48.74)	22 (50)	13 (37.14)	18 (60)	3 (75)	2 (33.33)
Neck, n (%)	24 (20.17)	4 (9.09)	6 (17.14)	14 (46.67)	0 (0)	0 (0)
Other features, ^a n (%)	17 (14.29)	6 (13.64)	8 (22.86)	3 (10)	0 (0)	0 (0)

Abbreviations: GF: gender-fluid; NB, nonbinary; TGM, transgender men; TGW, transgender women.

^aAmong “Other features,” 6 of 17 related to extremities including hands, arms, feet, and legs; 3 of 17 related to menstruation or internal reproductive organs; 2 of 17 related to hair or hairline; and 6 of 17 were not specified.

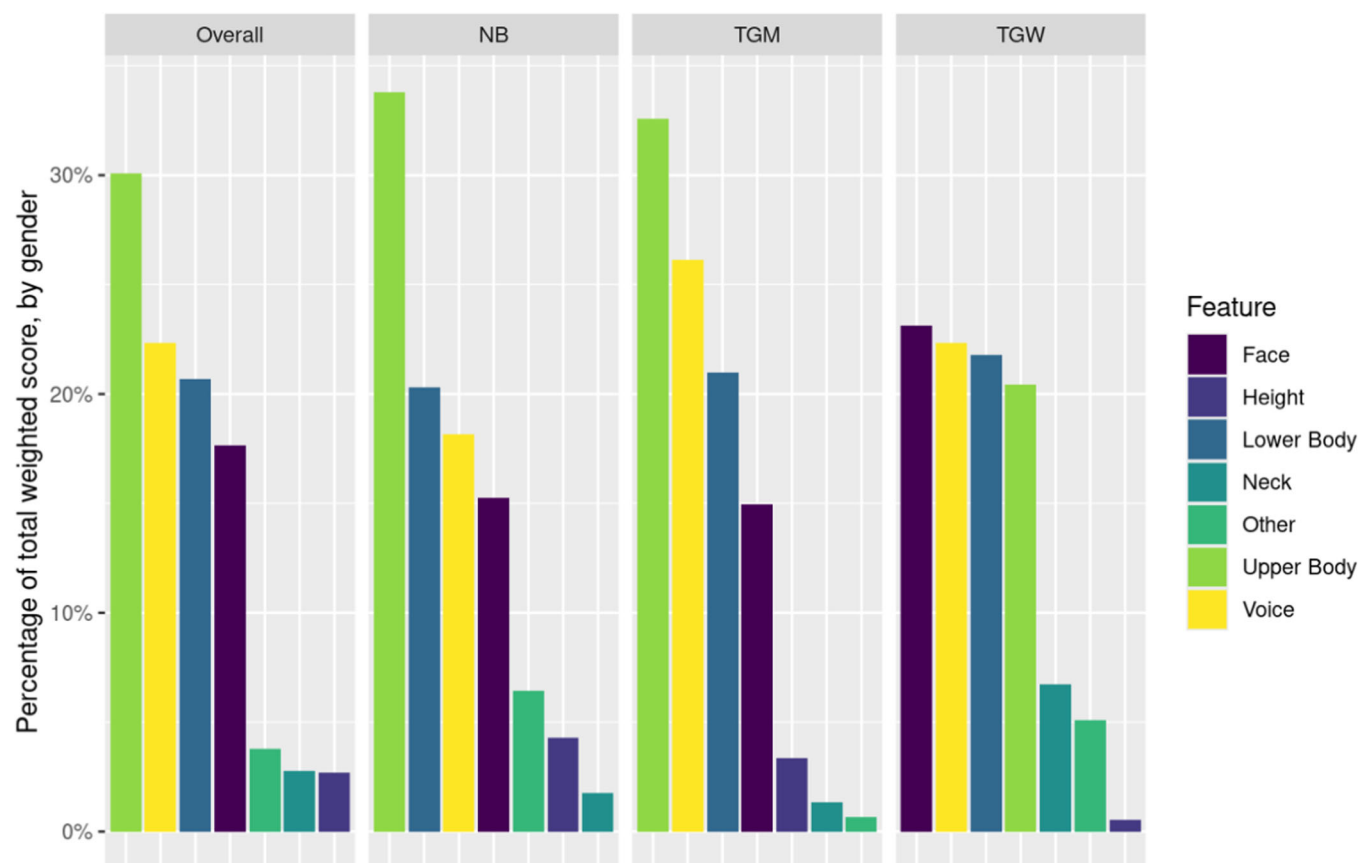


Figure 1. Features that contribute most to gender dysphoria, sorted from highest to lowest weighted score. NB, nonbinary; TGM, transgender men; TGW, transgender women.

voice and communication characteristics as a significant source of their gender dysphoria, then the primary provider can direct this individual to a center for voice and communication modification earlier in the transition process. This form of individualized medicine will likely result in overall earlier reduction in gender dysphoria and improvement in overall quality of life and psychological health.

Our results also show that voice plays a role in perception of gender incongruence attributed to others (rather than self). Voice is a vital part of communication in daily personal and professional life and can be a pervasive source of gender dysphoria when it becomes a source of gender incongruence that is recognized by others. Distinguishing between dysphoria related to perception by self and by others can influence the way in which physicians and voice professionals approach gender-affirming voice intervention. For example, if a patient mainly experiences dysphoria due to perception of voice by people at work but does not desire permanent change to their voice, then voice therapy may be the best option. Understanding the perception of dysphoria attributed to voice may be a beneficial paradigm to consider during voice therapy sessions and could be a potential area of future research.

Overall, the results of this study emphasize the importance of early voice interventions. Voice is a highly

desired gender-affirming intervention, and there are documented methods of gender-affirming voice interventions. Voice therapy and endoscopic vocal fold shortening (Wendler glottoplasty) are gender-affirming voice interventions for voice feminization with notable increases in fundamental frequency and voice-related quality of life measures.¹⁹⁻²¹ Hormonal therapy for voice masculinization typically results in significant masculinization of the voice with lowering of fundamental frequency,^{19,22} but some patients may require additional voice therapy to achieve long-term sustainable results. Greater access to voice therapy early in transition is critical for alleviating gender dysphoria related to voice. Surveying endocrinologists on their discussions with patients about voice changes and hormonal therapy could be an interesting future area of study.

Although the literature demonstrates improvements in voice-related quality of life measures following voice feminization interventions, the impact of gender-affirming voice intervention on overall dysphoria needs to be studied more thoroughly. Currently, validated tools, such as the Transgender Congruence Scale (TCS), consider how physical appearance relates to gender incongruence,^{23,24} but the TCS does not assess the physical characteristic of voice and communication. Another validated tool, the Vocal Congruence Scale, is a ten-item scale that assesses voice

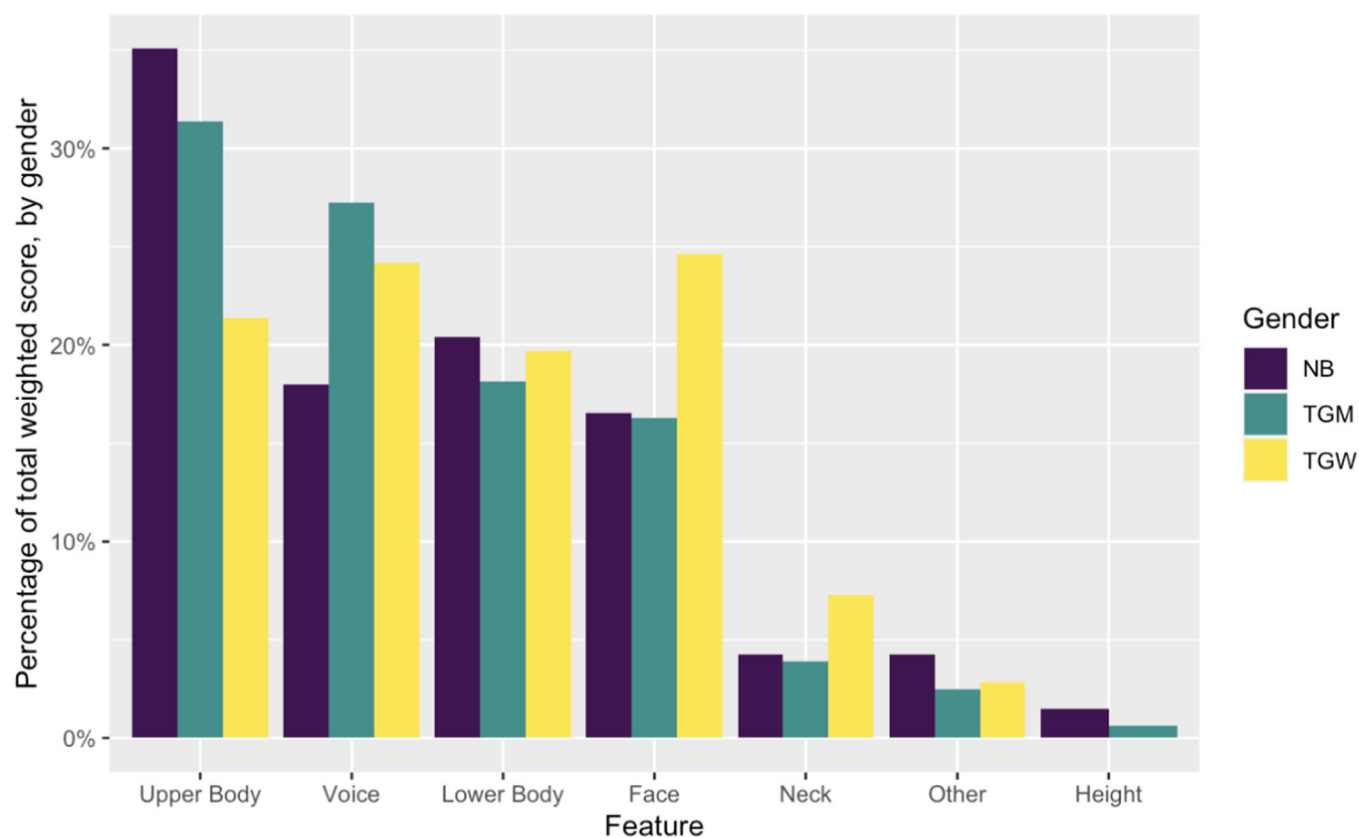


Figure 2. Priority of theoretical treatments or interventions that address gender dysphoria. NB, nonbinary; TGM, transgender men; TGW, transgender women.

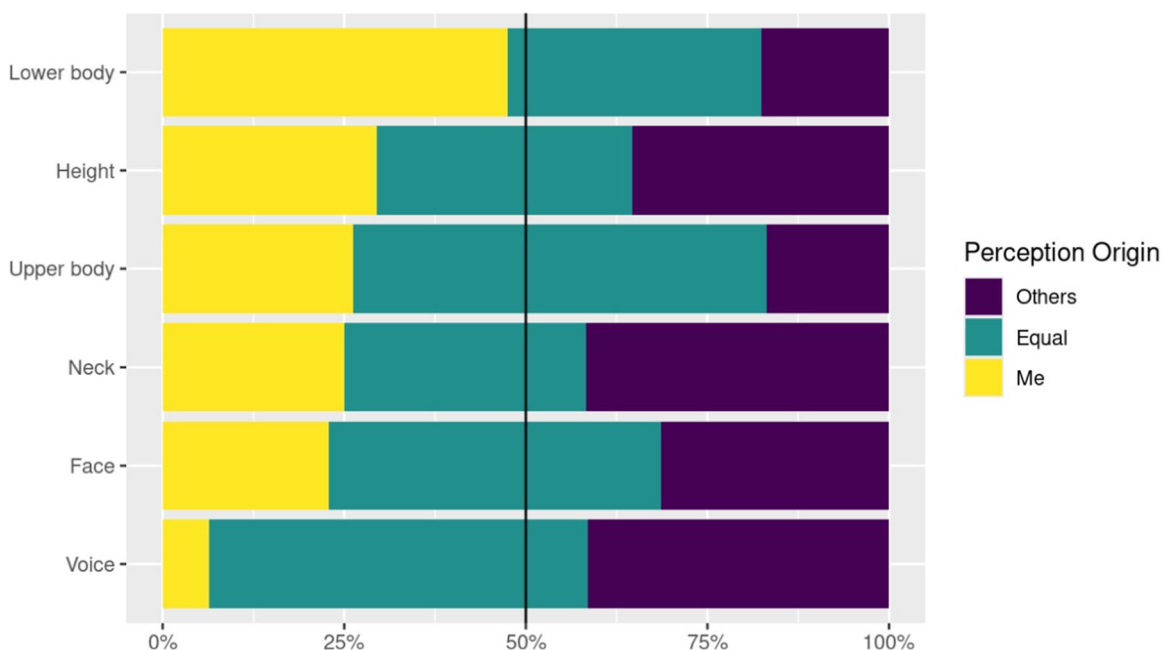


Figure 3. Origin of whether dysphoria is caused by self-perception, others' perception, or both equally, by feature.

incongruence only and does not appear to have a scoring system analogous to that of the TCS.¹⁴ Further, the Gender Congruence and Life Satisfaction Scale (GCLS) measures a variety of attributes and mental health factors but of the 38

items assessed, only one item is related to voice.²⁵ Although the GCLS does mention voice, the 38-item questionnaire is long and has a variety of limits, including accessibility of language which may limit compliance with survey

Table 2. Numbers Indicate Count and Percentage (in Parentheses) of Individuals in Each Category^a

	Overall	NB	TGM	TGW	GF	Others
Upper body <i>P</i> = .14	M: 28 (26.17) E: 61 (57.01) O: 18 (16.82)	12 (31.58) 17 (44.74) 9 (23.68)	5 (14.71) 23 (67.65) 6 (17.65)	9 (34.62) 14 (53.85) 3 (11.54)	1 (25.00) 3 (75.00) 0 (0)	1 (20.00) 4 (80.00) 0 (0)
Lower body <i>P</i> = .0003	M: 46 (47.42) E: 34 (35.05) O: 17 (17.53)	13 (41.94) 9 (29.03) 9 (29.03)	15 (48.39) 10 (32.26) 6 (19.35)	17 (60.71) 10 (35.71) 1 (3.57)	1 (33.33) 2 (66.67) 0 (0)	0 (0) 3 (75.00) 1 (25.00)
Voice <i>P</i> < .0001	M: 6 (6.38) E: 49 (52.13) O: 39 (41.49)	2 (6.90) 14 (48.28) 13 (44.83)	0 (0) 19 (61.29) 12 (38.71)	3 (12.00) 12 (48.00) 10 (40.00)	1 (33.33) 1 (33.33) 1 (33.33)	0 (0) 3 (50.00) 3 (50.00)
Face <i>P</i> = .30	M: 19 (22.89) E: 38 (45.78) O: 26 (31.33)	3 (12.00) 10 (40.00) 12 (48.00)	4 (16.00) 13 (52.00) 8 (32.00)	9 (36.00) 10 (40.00) 6 (24.00)	1 (50.00) 1 (50.00) 0 (0)	2 (33.33) 4 (66.67) 0 (0)
Height <i>P</i> = .80	M: 5 (29.41) E: 6 (35.29) O: 6 (35.29)	2 (33.33) 2 (33.33) 2 (33.33)	1 (12.50) 3 (37.50) 4 (50.00)	2 (66.67) 1 (33.33) 0 (0)	N/A N/A N/A	N/A N/A N/A
Neck <i>P</i> = .33	M: 6 (25.00) E: 8 (33.33) O: 10 (41.67)	1 (25.00) 2 (50.00) 1 (25.00)	0 (0) 3 (50.00) 3 (50.00)	5 (35.71) 3 (21.43) 6 (42.86)	N/A N/A N/A	N/A N/A N/A

Abbreviations: E, equal perception by self and others; GF: gender-fluid; M, dysphoria is caused by self-perception; N/A, indicating that no responses fell under these categories; NB, nonbinary; O, perception by others; TGM, transgender men; TGW, transgender women.

^a*P*-values for each feature were calculated using the Wilcoxon one-sample test. μ was set to 0 as the sentinel value to denote “equal perception by self and others.”

completion.²⁶ Evaluating the success of voice interventions in the overall experience of gender dysphoria requires accessible patient-reported outcome measures or questionnaires that are inclusive of voice as a component of gender-affirming care. Therefore, future efforts in transgender health research should seek to include voice as a significant contributor to gender dysphoria.

Limitations

There are some limitations to this study. Inherent to the design of a social media-distributed survey, there is a possible selection bias present. Our method of survey distribution, which leveraged the networks of one of our collaborators, introduced a potential source of bias; however, our post hoc analysis demonstrates no significant difference in ratings between the sources of social media survey. Our sample size limits the generalizability of these results. Future research in transgender health on outcomes or long-term satisfaction should aim to include voice to understand its results alongside other gender-affirming interventions. Regarding progress in transition, our measures of central tendency indicated that many respondents had already undergone some components of their transition. Therefore, our results have limited generalizability to those who have not yet started transitioning.

Additionally, minimal demographic data were collected in terms of past interventions or geographic details. Therefore, we have a limited understanding of the influence of factors such as personal medical history, age, and socioeconomic status on the rankings. Future research that includes a more detailed assessment of

patients' transition stages and duration of hormonal therapy could clarify at which point voice improvements (particularly secondary to hormonal therapy in TGM) begin to make an impact on overall gender dysphoria. Understanding the common challenges of those early in their transition could help providers understand the most effective ways to approach their patients.

Conclusion

This is the first study to show the relationship of voice to physical features outside of the head and neck in gender dysphoria. Voice is the second most important feature contributing to gender dysphoria and the second most desired intervention to alleviate gender dysphoria in this cohort of respondents. Given the importance of voice in the experience of gender dysphoria, it should be an early component of gender-affirming care. Additional efforts in transgender health research should include voice as a key component of gender-affirming health care.

Author Contributions

Serena Pu, study conception, study design, survey design, data collection, data analysis and interpretation of results, manuscript preparation, approval of final version of manuscript; **Leanne Goldberg**, study conception, study design, survey design, data collection, interpretation of results, manuscript preparation, approval of final version of manuscript; **Jennifer Ren**, data analysis and interpretation of results, manuscript preparation, approval of final version of manuscript; **A.C. Goldberg**, study conception, study design, survey design, data collection, interpretation of results, manuscript preparation, approval of final version of manuscript; **Mark Courey**, study conception,


study design, survey design, data collection, data analysis and interpretation of results, manuscript preparation, approval of final version of manuscript. All authors reviewed the results and approved the final version of the manuscript.

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