

Association Between Social Connection and Gender Identity Among Transgender and  
Gender-Diverse Veterans

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## **Abstract**

### Association Between Social Connection and Gender Identity Among Transgender and Gender-Diverse Veterans

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## **Background**

Social connection plays an important health buffering role in the wellbeing of transgender and gender-diverse (TGD) people. It is not well understood whether social connection differs between binary (transgender men and women) and nonbinary (individuals who do not identify as men or women) TGD individuals. This study compared social connection among binary transgender and nonbinary veterans who had not had but wanted gender-affirming surgery (GAS).

## **Methods**

Data were drawn from the 2022-2023 cross-sectional Gender-Affirming Care Evaluation (GRACE) study of TGD veterans. Our analytic sample included 3,354 individuals.

Generalized linear models with quasi-Poisson distribution were used to calculate adjusted

prevalence ratios (PRs) and 95% confidence intervals (CIs) measuring the relationship between gender identity and social connection. A secondary analysis was conducted to determine whether cost as a barrier to GAS impacted the relationship between gender identity and social connection.

## **Results**

In adjusted models, the prevalence of low social connection was higher in nonbinary individuals compared to binary transgender individuals for concern about reaction from family and/or friends to GAS (PR 2.13, CI: 1.85 – 2.45), difficulty finding a caretaker for GAS (PR 1.21, CI: 1.05 – 1.39), and feeling unsatisfied with social activities and relationships (PR 1.16, CI 1.06 – 1.27). The prevalences of being unpartnered were similar between nonbinary and binary transgender individuals (PR: 1.08, CI: 0.98 – 1.17). Associations between gender and concern about reaction from friends and/or family to GAS and difficulty finding a caretaker for GAS were stronger when cost was a barrier (p-value for interaction <0.05).

## **Conclusion**

Nonbinary individuals who have not had but want GAS were less socially connected compared with binary transgender peers. Nonbinary and binary transgender populations may have different experiences of social connection and should not be collapsed into one TGD category in research related to social support.

## Introduction

Decades of research have established a strong association between social connection and a wide range of health outcomes including mental health<sup>1-6</sup>, surgical outcomes<sup>7-10</sup>, and overall mortality risk<sup>11</sup>. In addition, there is a growing body of evidence suggesting social connection is associated with improved access to health services like receipt of life-improving surgery<sup>7</sup>, fewer emergency care visits, increased outpatient mental health visits, and shorter length of inpatient stays<sup>12</sup>. Research has demonstrated that interventions increasing social connection are associated with everything from improved utilization of health care resources<sup>12</sup> to reduced suicidality<sup>13</sup>. While social connection has been explored as a potential barrier to accessing gender affirming surgery for transgender and gender-diverse (TGD) people<sup>14,15</sup>, existing literature does not explore how gender identities underneath the TGD umbrella may have differing levels of social connection.

Prior research has demonstrated a link between social support and gender<sup>16-21</sup>. However, most studies erased transgender identities by equating sex and gender, and even fewer included separate categories for nonbinary individuals<sup>21</sup> (individuals who do not identify as a man or a woman). Additionally, most studies examined the role of gender as an effect modifier in the association between social support and other health outcomes<sup>16-18</sup>. While social support has been found to play an important role in the wellbeing of TGD people, with supportive social relationships playing a health-buffering role<sup>5,20,22-25</sup>, no prior studies have directly compared nonbinary to binary (transgender men and women) TGD individuals. The limited extant research does, however, point to potential differences in social support between these TGD subpopulations<sup>14,15,20</sup>. One study examining the association between mental health and social support of TGD people found that the low social support group had the highest proportion of nonbinary participants<sup>20</sup>. Two studies focusing on TGD access to GAS found lack of social resources (emotional support, having a caretaker) were barriers nonbinary individuals might experience more than their binary transgender peers<sup>14,15</sup>. Missing from this nascent research base are studies directly assessing the association between TGD gender identities and measures of social connection.

To address these research gaps, the primary aim of this study was to compare social connection between binary transgender and nonbinary veterans among those who want but have not yet received GAS. Both demand for and receipt of GAS has skyrocketed in recent years<sup>26-28</sup>, but significant barriers exist for many TGD people who want GAS<sup>14,15,29</sup>. More research is needed to understand these barriers and whether they differentially impact TGD subpopulations. Additionally, the VA is likely the largest provider of healthcare for TGD people in the U.S.<sup>30,31</sup> and TGD people are two times as likely to serve in the military compared to cisgender peers<sup>32</sup>. Research with the TGD veteran population can play a key role in facilitating greater understanding of not only the experiences of TGD individuals interested in GAS, but also specifically how perceptions of social connection differ between TGD subpopulations. We hypothesized that among TGD individuals who have not had but want GAS, nonbinary veterans would have lower social connection compared to binary

transgender peers. The secondary aim of this study was to assess whether the association between gender identity and social connection differs depending on whether cost is a barrier to receiving GAS. Cost is one of the most frequently stated barriers to receiving GAS<sup>14,15,29</sup>. Determining whether the association between gender identity and social connection is stronger among nonbinary vs. binary transgender people according to whether or not cost is a cited barrier to GAS will lend valuable insight into how associations between gender identity and social connection impact access to GAS for TGD populations.

## **Methods**

### *Study Design*

The data for the current study were drawn from the cross-sectional Gender-Affirming Care Evaluation (GRACE) study<sup>30,31</sup>. Participants for the GRACE study were recruited between September 2022 and July 2023 from a sample of about 14,000 veterans who were thought to be TGD. The study sample was identified using the VA's Corporate Data Warehouse, based on the presence of  $\geq 1$  International Classification of Diseases (ICD)-9 and/or ICD-10 codes indicating TGD identity<sup>33</sup> or self-reported gender identity. Eligible participants for the GRACE study included those who self-identified as transgender, nonbinary, gender-diverse, another related gender identity, or having a current gender identity different than the sex marker listed on one's initial birth certificate. GRACE study participants received \$15 for completion of the survey and were able to choose between completing the survey online, over the phone, or on paper. There were additional eligibility criteria for the present study. Individuals had to have answered the question, "If you had to choose only one of the following terms, which best describes your current gender identity?" Individuals who did not respond to this question were excluded from analysis because participant responses were used to determine gender identity, the primary exposure of interest. Additionally, individuals had to have responded "No" to the survey question, "Have you ever had any gender-affirming or transition related surgeries or procedures?" Only individuals who selected "No" to that question were asked about barriers to receiving GAS which were used to assess the primary outcome. Lastly, individuals who responded "strongly agree" or "somewhat agree" to the statement "I'm not interested in surgeries/procedures" were excluded from the study population because this study was focused on individuals who have not had but desire GAS in the future.

### *Primary Exposure*

The primary exposure was self-reported gender identity. Responses were grouped into "binary transgender" and "nonbinary" categories. The binary transgender category included "Man; Male", "Woman; Female", "Trans man; Trans male," and "Trans woman; Trans female." The nonbinary category included "Nonbinary" and "Genderqueer/gender non-conforming" responses. Those who selected "Gender identity not listed, please specify" were

assigned to the best fitting response option of the remaining six options if possible, and if not, considered missing and therefore excluded.

### *Assessment of Outcomes*

The primary outcome was social connection, which was evaluated through responses to four survey questions. The first two questions asked respondents to “Please rate each of the factors below as to why you have not had any gender-affirming surgeries or procedures”: 1) “Concern about reaction from family and/or friends” and 2) “Difficulty finding a caretaker (e.g. post-op recovery support).” Responses of “strongly agree” and “somewhat agree” were classified as negative for social connection and “strongly disagree,” “somewhat disagree,” and “neither agree nor disagree” responses were classified as positive for social connection. The third question, taken from the PROMIS Scale v1.2 - Global Health<sup>34</sup>, related to social connection was “In general, how would you rate your satisfaction with your social activities and relationships?” Responses of “fair” and “poor” were classified as negative for social connection and “excellent,” “very good,” and “good” were classified as positive for social connection. The fourth question related to social connection was “What is your current relationship status?” Responses of “partnered, living together” and “partnered, not living together” were classified as positive for social connection and responses of “single” were classified as negative for social connection.

### *Key Covariates*

Based on existing literature<sup>24,31</sup> and theorized associations between variables, a directed acyclic graph (**Figure 1**) was created and indicated that race, ethnicity, age, education, sex assigned at birth, and sexual orientation were required for adjustment. Race and ethnicity were collected using the question “How would you describe your racial and ethnic background?” Respondents were given the option to “select all that apply” from this list of options: “American Indian or Alaska Native,” “Asian American,” “Black or African American,” “Hispanic, Latinx, or Spanish origin,” “Middle Eastern or North African,” “Native Hawaiian or other Pacific Islander,” “White or Caucasian,” and “some other race, ethnicity, origin, please specify.” Age was collected from individual medical records. Education was measured via the survey question “What is the highest grade or year of school you completed?” with response options “9th to 11<sup>th</sup> grade (some high school),” “12<sup>th</sup> grade or GED (high school graduate),” “College 1 year to 3 years (some college or technical school),” “College 4 years or more (college graduate),” “Master’s Degree,” and “Doctoral Degree (PhD, MD, JD, etc.).” Sex assigned at birth was determined based on responses to the question “What sex were you assigned at birth, on your original birth certificate?” with response options being “male” and “female.” Sexual orientation was collected using the question “How would you describe your current sexual orientation” with response options “Asexual,” “Bisexual,” “Pansexual,” “Gay,” “Lesbian,” “Straight or Heterosexual,” “Queer,” and “Another sexual orientation, please specify.” Experiencing cost as a barrier to accessing GAS was included as a covariate because of its hypothesized role as an effect modifier in the relationship between exposure and outcome. Respondents were asked to “Please rate each

of the factors below as to why you have not had any gender-affirming surgeries or procedures” with one factor being “Cost”. Responses of “strongly agree” and “somewhat agree” were classified as positive for cost as a barrier to GAS; “strongly disagree,” “somewhat disagree,” and “neither agree nor disagree” were classified as negative for cost as a barrier to GAS.

### *Statistical Analysis*

First, respondent data on sociodemographic characteristics was descriptively assessed according to gender identity (nonbinary and binary transgender). No statistical testing was performed because no hypotheses were being tested. Next, associations between gender identity and each of the individual measures of social connection were assessed using quasi-Poisson regression models to calculate crude and adjusted prevalence ratios with 95% confidence intervals. To assess whether associations between gender identity and social connection differed among those who did and did not report cost as a barrier to receiving GAS, quasi-Poisson regression models were used to calculate prevalence ratios for each of the measures of social connection stratified by the cost variable. All regression models were adjusted for age, race, ethnicity, education, sex assigned at birth, and sexual orientation. Analyses were conducted using R.4.1.

## **Results**

Of the 14,006 individuals approached to participate in the GRACE study, 6,653 completed >80% of survey questions, 6,577 provided information on gender identity, and 3,354 participants indicated they desired but had not had any GAS and were thus included in this study. Of our final study population, 78% of study participants were assigned male at birth, but the nonbinary gender identity group had a slightly more even split between male (60%) and female (40%) assigned sex at birth (**Table 1**). Nonbinary participants were younger than binary transgender individuals; more than 50% (52%) of the nonbinary individuals were under 40 while 43% of binary transgender individuals were under 40. While white was the predominant race category for both gender identity groups, the proportions of Black/African American individuals (10% vs 7%) and missing race variable (11% vs 8%) were greater among nonbinary individuals compared to binary transgender individuals, respectively. Relative to binary transgender participants, a greater proportion of nonbinary participants were asexual (10% vs 6%) or queer (24% vs 6%), had an income greater than or equal to \$50,000 (50-≤75k: 21% vs. 17%, >\$75,000: 15% vs. 14%), and had a highest educational attainment of college (26% vs. 18%) or master’s or doctoral degree (12% vs. 8%).

For three of the four measures of social connection evaluated, nonbinary individuals had a higher prevalence of low social connection than binary transgender individuals (**Table 2**). The proportion of nonbinary individuals who were concerned about reactions from family and/or friends to GAS was about twice as high (43% vs. 21%) in nonbinary vs. binary

transgender individuals (aPR 2.13, 95% CI 1.85 – 2.45). The proportion of nonbinary individuals who had difficulty finding a caretaker after GAS was also higher (37% vs. 30%) in nonbinary vs. binary transgender individuals (aPR 1.21, 95% CI 1.05 – 1.39). The proportion of nonbinary individuals who were unsatisfied with their social activities and relationships was higher (56% vs. 49%) in nonbinary vs. binary transgender individuals (aPR 1.16, 95%CI 1.06 – 1.27). The proportion of nonbinary individuals who were unpartnered was the same (50%) in nonbinary vs. binary transgender individuals (aPR 1.08, 95% CI 0.98 – 1.17).

The association between gender identity and measures of social connection differed when stratified by cost for two of four measures of social connection. Among binary transgender and nonbinary individuals, 84% and 77%, respectively, stated cost was a barrier to receiving GAS (**Table 1**). Nonbinary individuals had a higher prevalence of concern about reaction from family and/or friends to GAS compared to binary transgender individuals across cost strata. The association for nonbinary gender identity and concern about reaction to family and/or friends to GAS was stronger when cost was a barrier to receiving GAS compared to when cost was not a barrier to receiving GAS (aPR 2.40, 95% CI 2.04 – 2.83 vs. aPR 1.34, 95% CI 1.01 – 1.77),  $p$  for interaction=0.002 (**Table 3**). The prevalence of difficulty finding a caretaker after GAS was 41% among nonbinary individuals when cost was a barrier to GAS and 22% among nonbinary individuals when cost was not a barrier to GAS. The association between nonbinary gender identity and difficulty finding a caretaker after GAS was positive when cost was a barrier (aPR 1.34, 95% CI 1.16 – 1.56) and null when cost was not a barrier (aPR 0.78, 95% CI 0.52 – 1.18),  $p$  for interaction=0.024. The satisfaction with social activities and relationships and partnership status variables had similar prevalence ratios when comparing between the cost is a barrier to GAS to cost is not a barrier to GAS strata (aPR 1.36, 95% CI 1.09 – 1.70 vs. aPR 1.15 95% CI 1.04 – 1.28, respectively).

## Discussion

Results from this study contribute to understanding the role of social connection within TGD populations. To our knowledge, our study is one of a handful to compare measures of social connection between binary transgender individuals and nonbinary individuals<sup>35</sup> and the first to assess the association between gender identity and social connection among a large population of TGD veterans. This study found that nonbinary individuals who wanted but had not had GAS evidenced lower social connection on the available measures compared to their binary transgender peers. Additionally, our study found that the association between gender identity and social connection differed based on whether cost was a barrier to receiving GAS.

Our results suggest that nonbinary individuals who have not had but desire GAS may be less socially-resourced than their binary transgender peers. Among the four measures of social connection evaluated, concern about reaction from family and/or friends to GAS was the

strongest association. This finding suggests that among TGD people who have not had but want GAS, connection to family and friends may be an especially concerning aspect of social connection for nonbinary people when compared to binary transgender individuals. This finding reinforces existing literature, where supportive relationships with family and friends have been shown to play a significant buffering role for mental health outcomes like anxiety and depression<sup>5</sup>. In a study examining the association between social support and anxiety and depression among TGD individuals, Pucket et al<sup>5</sup> found that family support had the strongest correlations between symptoms of anxiety and depression compared to other measures of social support. Tebbe et al.<sup>20</sup> found in their study examining the buffering effect of social support on the association between minority stress and mental health among TGD populations that individuals in the low-social support group had consistently little to no social support from family. This study did not compare nonbinary to binary transgender individuals, but it was noted that the low social support group had the highest proportion of nonbinary individuals. While these studies compared social connection within TGD populations using different methods, the similar associations between gender identity and family support are notable. In relation to TGD individuals who have not had but want GAS, our findings suggest lack of support from family and friends is a barrier to GAS nonbinary individuals experience more than binary transgender individuals.

Our study also found nonbinary individuals had greater difficulty finding a caretaker after GAS and lower satisfaction with social activities and relationships compared to binary transgender individuals. These findings are largely consistent with those from the limited existing relevant literature. In Pucket et al's<sup>15</sup> qualitative study researching barriers to GAS for TGD individuals, one nonbinary participant stated that "a lack of support network (friends and or family) to care for me during recovery" was a barrier to receiving top surgery. Instrumental support is a specific aspect of social support that includes providing tangible aid or resources, like financial support, food, or post-operative care. Tebbe et al<sup>20</sup> found that individuals in their low social support group, which was overrepresented by nonbinary individuals, reported substantially lower instrumental support when compared to the medium and high social support groups. Regarding satisfaction with social activities and relationships, Tebbe et al<sup>20</sup> included a measure of social isolation in their study that "assessed social dynamics related to the general presence or lack thereof of relationships in the participants' lives." They found that the participants in the low support group had the highest levels of social isolation. Although there are not directly comparable results to support the findings in this study, these studies support the idea that among people who have not had but want GAS, nonbinary individuals may have less instrumental social support and be less resourced in their social networks than binary transgender individuals.

Contrary to our hypothesis, nonbinary individuals were not more likely to be unpartnered compared to their binary transgender peers. Conventional scales of social support often include questions about partnership status<sup>36</sup> and there is some evidence in existing literature linking relationship status to mortality<sup>10,18</sup>. These factors informed the decision to include partnership status as a measure of social connection in this study. Importantly,

Pepping et al<sup>39</sup> found that romantic partnership is a buffer for minority stress in TGD individuals, but only when the relationship is satisfying. Dowers et al<sup>24</sup> additionally made the argument that commonly used measurements of social support are based on cisnormative assumptions inappropriate for measuring social support within TGD communities. Only measuring the absence of a romantic partner may not be an accurate proxy for social support within TGD communities.

The secondary aim of this study was to understand whether the association between gender and social connection among TGD individuals differed when cost was and was not a barrier to receiving GAS. Results were not consistent across our measures of social connection. The association between nonbinary gender identity and concern about reaction from family and/or friends to GAS was stronger among individuals who stated cost was a barrier. Notably, the prevalence of concern about reaction from family and/or friends to GAS was the same across both strata for nonbinary individuals, but higher for binary transgender individuals in the cost not being a barrier to GAS stratum. For nonbinary individuals, the only measure of social connection where prevalence of low social connection was different across cost strata was for difficulty finding a caretaker after GAS. The prevalence of nonbinary individuals who had difficulty finding a caretaker for GAS was halved among individuals for whom cost was not a barrier compared to those for whom cost was a barrier, while the prevalence of binary transgender individuals remained the same across cost strata. This resulted in a positive PR in the cost is a barrier stratum and a null PR in the cost is not a barrier stratum. This finding might be related to the kinds of surgeries nonbinary individuals want compared to binary transgender peers<sup>31</sup> and the intensity of post-operative care related to those surgeries, where binary transgender individuals may desire procedures that require longer term post-operative support that is more difficult to find<sup>14,31</sup>. Together, these findings suggest that for nonbinary individuals, removing cost as a barrier to GAS would not necessarily make GAS more accessible.

## **Strengths and Limitations**

There are notable limitations to this study. While this study's research question focuses on social connection as the main health outcome, the original GRACE study survey tool was not designed to evaluate questions related to social support. While there is not a validated quantitative scale measuring social support in the GRACE survey tool, the questions selected for this study's research question are directly related to the social support constructs represented in commonly used scales<sup>36-38</sup>. They provide valuable insight into survey respondent's perceived social connection, especially as it pertains to receipt of GAS. The observational nature of this study limits our ability to infer a causal relationship due to difficulties distinguishing temporality between the exposure and outcome. While it is possible that individuals who have supportive social networks are more likely to feel safe openly identifying as TGD, there is little to no evidence that social connection impacts whether an individual identifies as binary transgender or as nonbinary. It is unlikely the

causal pathway proposed in our study is reversed. Lastly, because our study population only included TGD people who had not had but wanted GAS, the results of this study may not generalize to TGD people who have had at least one GAS. Notably, the portion of TGD individuals who have not been able to access GAS may be at highest risk for low social connection and the most in need population for resources. Studying this population of TGD individuals is valuable and important for that reason.

## **Conclusion**

Overall, our research findings suggest that nonbinary individuals who have not had but want GAS are less socially connected when compared to their binary transgender peers across several measures of social connection. These results emphasize that nonbinary and binary transgender populations have different experiences of social connection and should not be collapsed into one TGD category in research related to social support, especially when receipt of GAS is of interest. These findings are important when considering the extensive literature demonstrating that social support is a health-buffering factor specifically within TGD populations<sup>5,20,23,24,39</sup>. Nonbinary individuals, as a less socially-resourced group compared to their binary transgender peers, may be at higher risk for adverse health outcomes that are buffered by social support.

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## Tables and Figures

**Table 1.** Sociodemographic characteristics of transgender and gender diverse (TGD) veterans who have not had but want gender affirming surgery (GAS) by gender identity, 2022-2023 ( $N=3,344$ ).

Characteristics	Binary transgender <sup>a</sup>	Nonbinary <sup>b</sup>
	( $N=2,749$ )	( $N=595$ )
	<i>n</i> (%)	<i>n</i> (%)
<i>Sex assigned at birth</i>		
Male	2,238 (81.4)	354 (59.5)
Female	493 (17.9)	236 (39.7)
<i>Age (mean, SD)</i>	45.7, 14.9	42.8, 14.3
<i>Age (years)</i>		
18-29	323 (11.7)	89 (15.0)
30-39	856 (31.1)	218 (36.6)
40-49	480 (17.5)	107 (18.0)
50-59	409 (14.9)	67 (11.3)
60-69	366 (13.3)	58 (9.7)
70+	229 (8.3)	40 (6.7)
<i>Race*</i>		
American Indian or Alaskan Native	203 (8.0)	40 (7.6)
Asian American	43 (1.7)	12 (2.3)
Black/African American	188 (7.4)	57 (10.8)
Middle Eastern or North African	16 (0.6)	1 (0.2)
Native Hawaiian or Pacific Islander	17 (0.7)	6 (1.1)
White	2,014 (79.4)	403 (76.2)
Some other race	55 (2.2)	10 (1.9)
Missing	213 (7.7)	66 (11.1)
<i>Ethnicity</i>		
Hispanic, Latinx, or Spanish Origin	262 (9.5)	64 (10.8)
<i>Sexual Orientation</i>		
Asexual	170 (6.2)	60 (10.1)
Bisexual	640 (23.3)	91 (15.3)
Lesbian or Gay	648 (23.6)	92 (15.5)
Pansexual	455 (16.6)	109 (18.3)
Queer	170 (6.2)	145 (24.4)
Heterosexual or straight	397 (14.4)	29 (4.9)
Another sexual orientation not listed	239 (8.7)	62 (10.4)

*Income (per year)\**

≤\$35,000	1,095 (43.8)	205 (38.8)
>\$35,000–≤\$50,000	637 (25.5)	135 (25.5)
>\$50,000 – ≤75,000	424 (17.0)	112 (21.2)
>75,000	344 (13.8)	77 (14.6)
Prefer not to answer	244 (8.9)	63 (10.6)

*Education*

≤ 12th grade or GED	560 (20.4)	70 (11.8)
Some college or technical school	1462 (53.2)	297 (49.9)
College graduate	503 (18.3)	156 (26.2)
Master's degree or doctoral degree	213 (7.7)	69 (11.6)

*Cost as barrier to receiving GAS*

Yes	2,305 (84.0)	459 (77.7)
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<sup>a</sup> Individuals who self-identity as woman, trans woman, female, trans female, man, trans man, male, trans male

<sup>b</sup> Individuals who identify as nonbinary, genderqueer, or another gender

\* Percentage counts calculated excluding missing or “prefer not to answer”

**Table 2.** Unadjusted and adjusted prevalence ratios examining the association between gender identity and measures of social connection among transgender veterans who have not had but want gender-affirming surgery (GAS), 2022-2023 (N=3,344)

<b>Gender Identity</b>	<b>N</b>	<b>Prevalence (%)</b>	<b>Unadjusted PRs (95% CI)</b>	<b>Adjusted<sup>1</sup> PRs (95% CI)</b>
<b><i>Concern about reaction from family and/or friends to GAS</i></b>				
Binary transgender <sup>a</sup>	582	21.2	1.00 (ref)	1.00 (ref)
Nonbinary <sup>b</sup>	255	42.9	2.02 (1.78, 2.30)	2.13 (1.85, 2.45)
<b><i>Difficulty finding a caretaker for GAS</i></b>				
Binary transgender	824	30.1	1.00 (ref)	1.00 (ref)
Nonbinary	216	36.5	1.22 (1.07, 1.38)	1.21 (1.05, 1.39)
<b><i>Unsatisfied with social activities and relationships</i></b>				
Binary transgender	1,341	48.9	1.00 (ref)	1.00 (ref)
Nonbinary	332	56.0	1.14 (1.05, 1.25)	1.16 (1.06, 1.27)
<b><i>Unpartnered</i></b>				
Binary transgender	1294	49.8	1.00 (ref)	1.00 (ref)
Nonbinary	285	50.2	1.01 (0.92, 1.10)	1.08 (0.98, 1.17)

<sup>1</sup>Adjusted for age, sex assigned at birth, sexual orientation, race, ethnicity, education

<sup>a</sup> Individuals who self-identity as woman, trans woman, female, trans female, man, trans man, male, trans male

<sup>b</sup> Individuals who identify as nonbinary, genderqueer, or another gender

**Table 3.** Adjusted prevalence ratios for measures of social connection among transgender veterans stratified by cost as a barrier to receiving gender-affirming surgery (GAS), 2022-2023

<b>Gender Identity</b>	<b>N</b>	<b>Prevalence (%)</b>	<b>aPR<sup>1</sup> (95% CI)</b>	<b>N</b>	<b>Prevalence (%)</b>	<b>aPR<sup>1</sup> (95% CI)</b>	
<b><i>Concern about reaction from family and/or friends to GAS**</i></b>							
		<i>Cost is a barrier</i>			<i>Cost is not a barrier</i>		
Binary transgender <sup>a</sup>	443	19.2	1.00 (ref)	134	30.7	1.00 (ref)	
Nonbinary <sup>b</sup>	195	42.5	2.40 (2.04, 2.83)	58	43.9	1.34 (1.01, 1.77)	
<b><i>Difficulty finding a caretaker for GAS*</i></b>							
		<i>Cost is a barrier</i>			<i>Cost is not a barrier</i>		
Binary transgender	704	30.6	1.00 (ref)	118	27.1	1.00 (ref)	
Nonbinary	187	40.7	1.34 (1.16, 1.56)	29	22.3	0.78 (0.52, 1.18)	
<b><i>Unsatisfied with social activities and relationships</i></b>							
		<i>Cost is a barrier</i>			<i>Cost is not a barrier</i>		
Binary transgender	1133	49.3	1.00 (ref)	203	46.5	1.00 (ref)	
Nonbinary	256	55.9	1.15 (1.04, 1.28)	75	57.3	1.36 (1.09, 1.70)	
<b><i>Unpartnered</i></b>							
		<i>Cost is a barrier</i>			<i>Cost is not a barrier</i>		
Binary transgender	1088	49.7	1.00 (ref)	204	49.9	1.00 (ref)	
Nonbinary	222	49.9	1.08 (0.97, 1.21)	61	51.3	1.08 (0.85, 1.37)	

<sup>1</sup> Adjusted for age, race, ethnicity, sex assigned at birth, education, sexual orientation

<sup>a</sup> Individuals who self-identity as woman, trans woman, female, trans female, man, trans man, male, trans male

<sup>b</sup> Individuals who identify as non-binary, genderqueer, or another gender

\*\* p-value for interaction model is <0.01

\* p-value for interaction model is <0.05

**Figure 1.** Directed acyclic graph of association between gender identity and social connection

