

Exploring Cross-Sectional Predictors of Suicide Ideation, Attempt, and Risk in a Large Online Sample of Transgender and Gender Nonconforming Youth and Young Adults

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Abstract

Purpose: Rates of suicide ideation and attempt appear to be particularly high in the transgender and gender nonconforming (TGNC) population, yet little is known about which factors are the most salient contributors for TGNC young people and how these contributors vary across suicide-related outcomes.

Methods: Within the largest sample of TGNC young people to date ($N=1896$; ages 14–30), we examined the contribution of demographics (age, assigned sex, gender identity, sexual orientation identity, race/ethnicity, and socioeconomic status), minority stress (gender-related affirmation, gender-related self-concept, victimization, and gender-affirming medical treatment desire/access), social support (from family and friends), and depressive symptoms in the cross-sectional prediction of three suicide-related outcomes: past-year attempt, past-year ideation, and a composite measure of suicide risk.

Results: Each set of factors explained significant variance in each outcome; however, only several predictors remained significant in each of the full models. Gender-related victimization and depressive symptoms were independent predictors for all three outcomes. Additional predictors varied across outcome. Age, male identity, sexual orientation-based victimization, and friend support were associated with suicide attempt. Age, queer identity, gender-related self-concept negativity, and family support were associated with suicide ideation, and pansexual identity and gender-related self-concept negativity were associated with positive suicide risk screen.

Conclusion: Prevention and intervention efforts aimed at building support and positive self-concept, decreasing victimization, and treating depression are likely to partially reduce suicide ideation and attempt in TGNC adolescents and young adults. Comprehensive interventions with younger adolescents are particularly critical.

Keywords: gender nonconforming, minority stress, suicide, transgender

Introduction

TRANSGENDER AND GENDER nonconforming (TGNC)* people appear to be at high risk of experiencing suicide ideation and attempts. A recent meta-synthesis found that the average lifetime rate of suicide ideation within studies of TGNC individuals is 55.5% (ranging from 28.9% to 96.5%) and for suicide attempts, it is 28.9% (ranging from 10.7% to

52.4%).¹ Several studies suggest that TGNC youth and young adults are particularly vulnerable to experiencing suicide ideation and attempt.^{2–5} This is consistent with statistics reflecting suicide as the third leading cause of death among adolescents and young adults 15–24 years of age and the second leading cause of death among those 25–30 years of age.⁶

Although a growing body of literature has begun to identify factors that contribute to suicide-related outcomes in the TGNC population, studies have historically been limited by small, geographically homogenous, and primarily adult samples, incorporation of a relatively small number of predictors, and examination of a single suicide-related outcome (e.g., attempt or ideation).^{7–15}

*We recognize that the terms gender diverse or gender expansive are increasingly preferred to that of gender nonconforming as they are considered to be less suggestive of pathology and/or cisgender bias. We chose to retain gender nonconforming to remain consistent with how the study was advertised and described to participants.

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Minority stress perspectives

During the past several decades, theories of minority stress have been developed to identify risk factors associated with minority status and elucidate their impact on mental health outcomes, including suicide ideation and attempts.^{16–19} Studies with the TGNC adult population have most commonly identified victimization (i.e., harassment, threats, and violence)^{8,12,15,20–22} and rejection or lack of support from family and friends^{20,23} as risk factors for suicide outcomes. However, within multivariate models, social support^{23,25,26} and/or victimization^{15,27} have not always been found to be significant independent predictors of suicide-related outcomes. Among studies of TGNC youth and young adults, three found a relationship between victimization and suicide ideation,^{2,3,5} one between friend support, but not family connectedness and past-year suicide ideation,⁵ one between parental closeness and lifetime suicide ideation,² and one between parental rejection and lifetime suicide attempt.¹¹

The ability to identify and express one's gender and have this sense of self accurately reflected back by others has been theorized to be an important contributor to mental health within the TGNC population.^{17,18} One study has linked lack of affirmation to a composite scale of past-year suicide ideation,¹⁶ one has linked felt stigma to past-year suicide plans/attempts,²⁵ and an additional study has linked a measure of structural stigma (e.g., statewide presence of LGBT youth groups, antidiscrimination policies) to past-year suicide attempt.³

Several measures of self-concept associated with one's gender identity and expression have also been linked to suicide-related outcomes, including internalized transphobia and suicide risk,²⁶ internalized transphobia and past-year suicide attempt,²⁸ and feelings of shame and past-year suicide ideation (but not suicide planning/attempts).²⁵

In a study of transgender women, receipt of hormone therapy and breast augmentation were associated with lower rates of lifetime suicide ideation²⁹; however, in a second study of transgender men, rates of lifetime suicide attempt were similar for those who had received hormone therapy compared with those who had not.³⁰ Of note, gender-related affirmation, self-concept, and access to and/or use of gender-affirming care have yet to be examined in studies of TGNC youth and suicide-related outcomes.

Theories of suicide

Interpersonal and self-concept related factors similar to those identified within the minority stress literature have been linked to suicide ideation and attempt in samples of youth, including family support, victimization, and self-esteem.^{31–34} Mental health conditions, most notably depression, have also been commonly identified as contributors to both suicide ideation and attempt.^{35–38} Theories of suicide have been developed to integrate these risk factors, such as the Interpersonal Theory of Suicide, which posits that lack of interpersonal connection and support produces feelings of perceived burdensomeness and lack of belonging that drive suicide ideation.³⁹ These states are thought to interact with experiences that reduce one's threshold to inflict self-harm, such as victimization, abuse, or previous attempts, to result in suicide attempt.³⁹ Two recent studies have found support for aspects of the Interpersonal Theory within TGNC samples.^{4,16}

Another commonly referenced theory of suicide that has not yet been explicitly examined within a TGNC sample, the Escape From Self Theory, posits that states of aversive self-awareness combine with thinking patterns common during episodes of depression and significant life stress (e.g., distorting gains and losses associated with suicide) to result in suicide ideation and attempt.⁴⁰ Of note, debate currently exists within the literature regarding how distinct predictors of suicide attempt are from suicide ideation.^{41,42}

Demographic variability in suicide risk

Several demographic characteristics have been associated with suicide risk. Developmentally, individuals appear most likely to experience suicide ideation and make an attempt during adolescence or young adulthood.^{43,44} Women are more likely to experience suicide ideation and attempt compared with men, whereas men die by suicide approximately three times more often than women.^{43,45} Results are more mixed within (primarily adult) TGNC samples, with some studies finding higher rates of suicide outcomes among participants who were younger^{20,21,46} and assigned female at birth (AFAB)^{20,25,28} and other studies failing to find these relationships.^{3,5,15,23,25,47}

Rates of suicide appear lowest in Hispanic and African American populations and highest in Native American populations⁴⁸; however, differences in suicide ideation and attempt are less clear,⁴⁹ including within the few studies of TGNC individuals that have examined racial/ethnic differences.^{3,10,20,25} Several studies of TGNC individuals have also linked lower socioeconomic status with higher rates of suicide ideation and/or attempt,^{13,14,46} and one out of four studies found differences by sexual orientation, with all identities other than heterosexual associated with higher rates of suicide attempt.^{3,7,21,46}

Study aims

This study addresses important gaps in the literature using a large, geographically diverse sample of TGNC adolescents and young adults ($N=1896$; ages 14–30). Three suicide-related outcomes were assessed: past-year suicide attempt, past-year suicide ideation, and a suicide risk screen using the Suicidal Behaviors Questionnaire-Revised (SBQ-R).⁵⁰

An integrative framework was employed to identify cross-sectional predictors of suicide, which included the following sets of factors: demographics (age, assigned sex, race/ethnicity, socioeconomic status, gender identity, and sexual orientation identity), minority stress (gender-related affirmation, gender-related self-concept, victimization, and gender-affirming medical care (GAMC) desire/access), social support (from family and friends), and depressive symptoms. We hypothesized that each set of factors would contribute to the prediction of each suicide-related outcome, but we did not have any a priori hypotheses regarding which variables would be significant independent predictors when considered within the context of all other variables.

Methods

Participants

Potential participants were eligible to participate in the online survey if they (a) were 14–30 years old, (b) self-identified as a gender identity other than or in addition to

their sex assigned at birth, and (c) lived in the United States. This language is consistent with other studies examining suicide-related outcomes within TGNC samples^{5,14-16,46} and was selected to be inclusive of individuals who identified with a broad range of gender identities instead of implying that only individuals with certain gender identities (e.g., transgender) were eligible to participate. The survey was advertised as a study of TGNC health and development and was approved by the institutional review board at the University of Illinois at Chicago.

All participants provided consent by reviewing information about the study and indicating their wish to participate. Participants were then required to successfully complete a decision-making capacity screener that assessed knowledge of key information contained in the consent form.⁵¹ A waiver of parental consent was obtained to protect the privacy of participants younger than 18 years of age. Participants were provided with contact information for a youth advocate to ask questions about the study, crisis hotline information, and strategies to increase the anonymity of their participation. After completion, participants were able to enter a raffle for a \$50 Amazon.com gift card (1 in 75 chance of winning).

Measures

Demographics. Participants were asked to self-report their age, sex assigned at birth, race/ethnicity, state of residence, the socioeconomic status of the “household [they] grew up in,” and their strength of identification (not at all [0], somewhat [1], moderately [2], and strongly [3]) with 14 gender identities (male, female, transgender, transsexual, gender nonconforming, FTM (female to male), MTF (male to female), genderqueer, androgynous, third gender, agender, two spirit, cross dresser, and drag performer (king/queen)), or could indicate not listed and eight sexual orientation identities (homosexual, bisexual, heterosexual, gay, lesbian, queer, pansexual, and asexual) or indicate that their sexual orientation identity was not listed. Participants were able to identify with more than one race/ethnicity, gender identity, and sexual orientation identity. States were recoded into region, as identified by the U.S. Census Bureau.⁵²

Gender-related affirmation. This seven-item measure consists of two subscales rating past-year gender-related support (four items, e.g., “people in my life have been accepting of my gender identity/expression”; $\alpha=0.82$) and gender-related expression ability (three items, e.g., “I have been able to openly dress and style myself the way that I want”; $\alpha=0.79$) using a 4-point scale (not at all true [0], somewhat true [1], moderately true [2], and very true [3]). The study’s first author developed measure items from qualitative interviews with TGNC youth regarding their gender identity development.^{53,54} The two subscales included in the analyses were identified using exploratory followed by confirmatory factor analysis within a larger pool of items administered within this study.

Gender-related self-concept. This seven-item measure is informed by Baumeister’s Escape From Self Theory⁴⁰ of suicide and was developed to assess participants’ thoughts and emotions related to their gender identity/expression during the past year. The measure consists of two subscales: gender-related self-concept negativity (four items, e.g., “I feel

ashamed or embarrassed when I think about my gender identity/expression”; $\alpha=0.70$) and gender-related self-concept clarity (three items, e.g., “I have a clear understanding of my gender identity/expression”; $\alpha=0.82$). This measure was developed using the same item development and factor analysis process as described for gender-related affirmation subscales and uses the same 4-point scale.

Victimization. Both gender-related ($\alpha=0.78$) and sexual orientation-related ($\alpha=0.80$) victimization were assessed using a modified version of the measure developed by the Gay, Lesbian and Straight Education Network.⁵⁵ This measure assessed six forms of victimization occurring during the past year (verbal harassment, physical harassment, physical assault, sexual harassment, sexual assault, and Internet- or phone-based harassment) using a 4-point scale (never [0], rarely [1], sometimes [2], and often [3]). Participants were asked to separately indicate whether each form of victimization occurred “because of your sexual orientation” or “because of your gender identity/expression.”

Gender-affirming medical care. Participants were asked to indicate the extent to which they desired three forms of GAMC: gender-affirming hormone therapy, “top” (e.g., mastectomy and breast enhancement), and “bottom” surgery (e.g., phalloplasty, metoidioplasty, and vaginoplasty) on a 5-point Likert scale (no desire [0] to extreme desire [4]). Participants were also asked to indicate the extent to which cost or lack of access prevented them from obtaining or undergoing each form of GAMC using a 6-point scale (strongly disagree [0] to strongly agree [5]). These items were combined into two composite scales reflecting desire for GAMC ($\alpha=0.73$) and difficulties accessing GAMC ($\alpha=0.75$).

Social support. General family (four items, e.g., “my family really tries to help me”; $\alpha=0.93$) and friend (four items, e.g., “I can count on my friends when things go wrong”; $\alpha=0.93$) social support were measured using the Multidimensional Scale of Perceived Social Support.⁵⁶ Items are rated on a 6-point scale (strongly disagree [0] to strongly agree [5]). This measure has been used in previous studies of the LGBT population.^{26,27}

Depressive symptoms. The nine-item version of the Patient Health Questionnaire (PHQ-9) was used to measure depressive symptoms, excluding the item measuring suicide ideation ($\alpha=0.90$).⁵⁷ Items are rated on a 4-point scale (not at all [0], several days [1], more than half the days [2], and nearly every day [3]). The PHQ-9 was designed to measure Diagnostic and Statistical Manual of Mental Disorders IV-TR⁵⁸ symptoms of depression, has demonstrated reliability and validity, and has been used extensively in clinical and research settings.

Suicide-related outcomes. A binary variable reflecting past-year suicide attempt was created using a modified version of the SBQ-R lifetime suicide severity item adjusted to reflect the past year.⁵⁰ A second binary variable reflecting past-year suicide ideation was created using the SBQ-R item assessing frequency of thoughts of suicide. Finally, a third binary variable reflecting a positive suicide risk screen was

created using the scoring procedure and more stringent psychiatric (vs. general population) cutoff score provided by the SBQ-R authors (>7).⁵⁰ Scores are calculated using four Likert-scale items assessing lifetime suicide ideation/attempt severity, strength of past-year suicide ideation, lifetime disclosure of considering suicide (termed “threat of attempt”), and self-rated likelihood of future attempt. Lifetime rates of suicide ideation and attempt are reported for comparison purposes.

Analytic strategy

Before conducting the main analyses, bivariate correlations were examined for all continuous variables. For race/ethnicity, gender identity, and sexual orientation identity, regressions were also conducted to test whether each factor was significantly associated with each outcome and to identify which specific identities were independent predictors. For the categorical variable region of the United States, omnibus analysis of variance was used. Only variables with significant relationships to each outcome were included in the subsequent analyses.

To test the hypothesis that each set of factors (demographics, minority stress, social support, and depressive symptoms) contributes to the cross-sectional prediction of each suicide-related outcome (past-year suicide attempt, past-year suicide ideation, and positive suicide risk screen), logistic regressions were conducted using SPSS version 23 (IBM Corp., Armonk, NY), one for each set of factors and each outcome. Nagelkerke R^2 value change scores were used to determine significance.⁴⁶

To identify which individual variables were significant independent predictors, logistic regressions were then conducted for each outcome that simultaneously included all variables. Collinearity diagnostics were conducted for each variable within the full model using the Variance Inflation Factor and all values were in the acceptable range (<2.85).⁵⁹

Results

As seen in Table 1, participants ($N=1896$) were recruited into the online survey primarily through postings on Tumblr and Facebook. Completion rates were high, with only 3.8% of participants dropping out during the survey. Analysis of variance omnibus tests revealed that rates of suicide ideation and positive suicide risk screen differed by recruitment source. No other recruitment effects were identified. Follow-up Tukey tests revealed that these differences were driven by higher levels of suicide ideation and positive suicide risk screen among participants recruited through Tumblr. To control for these effects, a dichotomous variable reflecting recruitment from Tumblr was included within the analyses.

Demographic information is displayed in Table 1. A large majority of participants were AFAB (78.1%). The mean age of participants was 21.1 (SD 4.35), with those AFAB younger (20.6, SD 4.22) than those assigned male at birth (AMAB) (22.8, SD 4.35); $t(2048)=9.99$ $p<0.001$. Participants AFAB most strongly identified as male, transgender, and genderqueer, whereas participants AMAB most strongly identified as female, transgender, and MTF. In terms of sexual orientation identity, both participants AFAB and those AMAB most strongly identified as queer and pansexual.

Table 2 displays bivariate correlations between variables and Table 3 displays ranges and mean scores and standard

TABLE 1. OVERVIEW OF PARTICIPANT RECRUITMENT SOURCE AND DEMOGRAPHICS ($N=1896$)

Variable	<i>n</i>	%
Recruitment source		
Tumblr	912	48.1
Facebook group	510	26.9
Facebook advertising	227	12.0
Referred by friend	184	9.7
Other	63	3.3
Sex assigned at birth		
Male	416	21.9
Female	1480	78.1
Race/ethnicity		
White	1701	89.7
Black or African American	105	5.5
American Indian or Alaska Native	104	5.5
Hispanic or Latino	174	9.2
Asian or Pacific Islander	102	5.4
Arab or Middle Eastern	33	1.7
Age		
14–17	477	25.2
18–21	610	32.2
22–25	451	23.8
26–30	358	18.9
Location (region of US)		
New England	182	9.6
Mid-Atlantic	380	20.0
South	399	21.0
Midwest	467	24.6
West (excluding CA)	268	14.1
California	200	10.5
Socioeconomic status		
Lower class	186	9.8
Lower middle class	573	30.2
Middle class	711	37.5
Upper middle class	388	20.5
Upper class	38	2.0

Respondents were able to select more than one race/ethnicity.
US, United States; CA, California.

deviations for continuous variables. Most variables were correlated with each suicide-related outcome, although the strength of most correlations was in the weak range ($<\pm 0.3$). Region of the United States ($\chi^2(5)=6.47$, $p=0.26$; $\chi^2(5)=6.00$, $p=0.31$; $\chi^2(5)=9.94$, $p=0.08$) and race/ethnicity ($\chi^2(6)=6.73$, $p=0.35$; $\chi^2(6)=6.40$, $p=0.38$; $\chi^2(6)=10.5$, $p=0.10$) were not associated with any suicide-related outcomes, whereas gender identity ($\chi^2(15)=42.24$, $p<0.001$; $\chi^2(15)=36.85$, $p=0.001$; $\chi^2(15)=30.62$, $p=0.01$) and sexual orientation identity ($\chi^2(9)=25.60$, $p=0.01$; $\chi^2(9)=52.08$, $p<0.001$; $\chi^2(9)=54.12$, $p<0.001$) were significant for all three outcomes (suicide attempt, ideation, and positive risk score, respectively).

As seen in Table 4, rate of past-year suicide ideation was high (83.7%) as was the percentage who screened positive for suicide risk (81.3%); however, the rate of past-year suicide attempt was much lower (10.9%). For comparison, 95.5% reported lifetime suicide ideation and 32.3% reported lifetime attempt.

As hypothesized, R^2 scores indicate that each group of variables contribute as is significantly to the prediction of suicide attempt, ideation, and positive suicide risk screen. Depressive

TABLE 2. BIVARIATE CORRELATIONS BETWEEN STUDY VARIABLES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Suicide attempt	–															
2. Suicide ideation	0.15**	–														
3. Positive suicide risk screen	0.17**	0.71**	–													
4. Assigned sex	.01	0.07**	0.05*	–												
5. Age	–0.20**	–0.21**	–0.13**	–0.22*	–											
6. Socioeconomic status	0.06**	0.03	0.07**	0.04	0.11**	–										
7. Gender-related support	–0.13**	–0.22**	–0.19**	–0.10**	0.26**	–0.08**	–									
8. Gender-related expression ability	–0.10**	–0.16**	–0.13**	0.21**	0.16**	–0.06*	0.47**	–								
9. Gender-related self-concept clarity	0.00	–0.09**	–0.04	–0.11**	0.13**	0.07**	0.30**	0.25**	–							
10. Gender-related self-concept negativity	0.10**	0.22**	0.19**	0.09**	–0.20**	0.00	–0.45**	–0.35**	–0.43**	–						
11. Gender-related victimization	0.29**	0.18**	0.23**	–0.04	–0.08**	0.13**	–0.21**	–0.18**	0.10**	0.12**	–					
12. SO-related victimization	0.31**	0.16**	0.20**	0.05*	–0.14**	0.14**	–0.24**	–0.21**	–0.05*	0.17**	0.78**	–				
13. Desire for GAMC	0.06*	0.05*	0.11**	–0.09*	0.04	0.08**	0.04	0.04	0.46**	–0.04	0.19**	0.01	–			
14. Difficulties accessing GAMC	0.11**	0.15**	0.19**	–0.00	–0.12**	0.18**	–0.24**	–0.18**	0.15**	0.13**	0.22**	0.12**	0.57**	–		
15. Friend support	–0.12**	–0.14**	–0.12**	–0.04	0.11**	–0.10	0.44**	0.21**	0.13**	–0.29**	–0.14**	–0.16**	–0.04	–0.10**	–	
16. Family support	–0.13**	–0.22**	–0.21**	–0.03	0.15**	–0.13**	0.45**	0.33**	0.08**	–0.23**	–0.27**	–0.23**	–0.08**	–0.25**	0.29**	–
17. Depressive symptoms	0.22**	0.39**	0.37**	0.06**	–0.24**	0.14**	–0.38**	–0.30**	–0.16**	0.35**	0.34**	0.34**	0.11**	0.27**	–0.29**	–0.33**

** $p < 0.01$, * $p < 0.05$. Due to the relatively large number of gender and sexual orientation identities, these correlations are omitted, but are discussed in the text.

TABLE 3. RANGES AND MEANS AND STANDARD DEVIATIONS FOR CONTINUOUS STUDY VARIABLES

Variable	Range (absolute)	Mean (SD)
Age	14–30	21.09 (4.35)
Socioeconomic status	0–4	2.25 (0.96)
Male identity	0–3	1.13 (1.22)
Transgender identity	0–3	2.06 (1.10)
Transsexual identity	0–3	0.89 (1.12)
FTM identity	0–3	1.09 (1.23)
Third gender identity	0–3	0.39 (0.82)
Cross-dresser identity	0–3	0.33 (0.74)
Homosexual identity	0–3	1.13 (1.10)
Queer identity	0–3	2.10 (1.17)
Pansexual identity	0–3	1.52 (1.23)
Not listed SO identity	0–3	0.35 (0.91)
Gender-related support	0–12	6.15 (3.01)
Gender-related expression ability	0–9	5.86 (2.63)
Gender-related self-concept clarity	0–9	5.93 (2.54)
Gender-related self-concept negativity	0–12	3.35 (2.75)
Gender-related victimization	0–18	3.46 (3.38)
SO-related victimization	0–18	2.71 (3.15)
Desire for GAMC	0–12	6.05 (3.66)
Difficulties accessing GAMC	0–15	8.30 (4.90)
Friend support	0–20	13.59 (4.94)
Family support	0–20	7.82 (5.60)
Depressive symptoms	0–24	12.06 (6.50)

Only variables for which significant bivariate correlations existed are listed (Table 2).

FTM, female-to-male; SO, sexual orientation; GAMC, gender-affirming medical care; SD, standard deviation.

symptoms (0.267, 0.229) followed by minority stress variables (0.170, 0.184) explained the largest variance in suicide ideation and positive suicide risk score, whereas minority stress variables (0.170) and demographic variables (0.119) explained the largest variance in suicide attempt. Social support variables explained the largest variance in suicide ideation (0.092) and the smallest variance in suicide attempt (0.048). Comparing R^2 scores for the full model to the sum of R^2 scores across variable groups, approximately half of the variance explained by variable groups reflected shared variance in the full model (44.8%–48%).

Results of the final logistic regression analyses are displayed in Table 5. Higher levels of gender-related victimization and depressive symptoms were independently associated with all three outcomes. Age was negatively associated with both suicide attempt and ideation, and gender-related self-concept negativity was positively associated with both suicide ideation and positive suicide risk score. Male identity and friend support were also negatively associated with suicide attempt and SO-related victimization was positively associated with suicide attempt. Queer identity was also positively associated with suicide ideation and family support was negatively associated. Finally, pansexual identity was also positively associated with positive suicide risk screen.

Discussion

This study represents the largest and most geographically diverse investigation of suicide-related outcomes among

TGNC adolescents and young adults (14–30 years of age) to date. The overall lifetime suicide attempt rate was similar to previous studies with TGNC populations (32.3% vs. 28.9%), although the lifetime suicide ideation rate was higher (95.5% vs. 55.5%).¹ The study findings are generally in line with previous research on suicide ideation and attempt within youth samples, which have identified victimization, lack of family and friend support, poor self-concept, and depressive symptoms as risk factors,^{31–34} as well as research with TGNC samples that have found similar relationships.^{2,5,8,12,15,20–24} The findings are also consistent with the minority stress perspective, which emphasizes the role of both minority-specific and general factors in explaining higher rates of mental health concerns.^{16–19}

Nearly all proposed predictors were correlated with all three suicide-related outcomes and each set of factors (demographics, minority stress, social support, and depressive symptoms) explained significant variance in each outcome. However, only several cross-sectional predictors remained significant in the final model and these predictors varied somewhat across outcomes. Previous studies with TGNC samples have found differences by sex,^{20,25,28} socioeconomic status,^{13,14,46} gender affirmation-related constructs,^{25,26,28} and access to GAMC²⁹ that were not present within this study's full model.

These differences may relate to the smaller sample sizes generally found in previous studies and/or shared variance present within the differing groups of variables included across studies. In particular, two LGBT-focused studies have identified depression as a mediator between the risk factors of victimization and lack of social support, and the outcome of suicide attempts.^{15,27} The Escape From Self Theory also suggests that self-concept moderates and/or mediates the relationship between life stressors and suicide ideation/attempt.⁴⁰ In this study, gender-related self-concept negativity was independently associated with suicide ideation and positive suicide risk screen, but not suicide attempt. Conversely, victimization appeared to be most strongly associated with suicide attempt, which is consistent with the hypothesis stemming from the Interpersonal Theory of Suicide that experiences of violence reduce the threshold to inflict self-harm.³⁹

The utility of the SBQ-R⁵⁰ as a suicide risk screen was unclear. Positive suicide risk screen appeared to be closely related to past-year ideation, which is consistent with research suggesting that suicide ideation is an important predictor of future attempt, but not particularly helpful at identifying those with recent or imminent attempts (high false positive rate). Although several suicide screeners focus exclusively on ideation,^{60,61} most appear to integrate both ideation and attempt^{62,63} and have been criticized for failing to differentiate between the two.^{42,64}

In comparison to most studies of suicide with TGNC samples, this study examined a much broader range of cross-sectional predictors across three suicide-related outcomes within a large sample. However, a majority of variance in these outcomes was left unexplained (66.8%–76.1%) and even when considered as a group, demographic (7.3%–11.9%), minority stress (17.0%–18.4%), and social support (4.8%–9.2%) factors explained relatively small amounts of variance. This is consistent with a recent meta-analysis that found that demographic, mental health, and interpersonal risk factors for suicide ideation and attempt each made similar, yet weak contributions to explaining variance in both

TABLE 4. FREQUENCIES FOR SUICIDE IDEATION, ATTEMPT, AND POSITIVE RISK SCORE AND NAGELKERKE R² VALUES BY VARIABLE TYPE

	<i>Endorsed/scored positive, %</i>	<i>Demographic variables</i>	<i>Minority stress variables</i>	<i>Social support variables</i>	<i>Depressive symptoms</i>	<i>Full model</i>
Suicide attempt (past year)	10.9	0.119	0.170	0.048	0.096	0.239
Suicide ideation (past year)	83.7	0.104	0.170	0.092	0.267	0.332
Positive suicide risk score	81.3	0.073	0.184	0.074	0.229	0.291

All R² values are significant to the $p < 0.001$ level.

outcomes, and no specific variable emerged as particularly critical.⁴¹ As proposed by these authors, theoretical models of suicide ideation/attempt hold promise for improving prediction by identifying specific processes and factors that have not received as much research attention and modeling complex relationships between processes/factors.

The vast majority of studies of suicide outcomes within the TGNC population, including this study, has been guided by the minority stress framework, but have not developed or tested specific theoretical models. Two recent studies guided by the

Interpersonal Theory are an exception.^{4,16} In one study of TGNC adults, rejection and lack of affirmation were associated with internalized transphobia and expectations of negative treatment, which were in turn related to suicide ideation via thwarted belongingness and perceived burdensomeness.¹⁶ However, suicide attempt, the role of acquired capability, and interactive effects were not examined. In a second smaller study of TGNC youth, the interaction between painful/provocative events and thwarted belongingness (but not perceived burdensomeness) was associated with lifetime suicide attempt.

TABLE 5. LOGISTIC REGRESSION ANALYSES PREDICTING PAST-YEAR SUICIDE ATTEMPT, SUICIDE IDEATION, AND SUICIDE RISK SCREEN USING PREDICTORS WITH SIGNIFICANT BIVARIATE RELATIONSHIPS (N=1896)

	<i>Suicide attempt (past year)</i>			<i>Suicide ideation (past year)</i>			<i>Suicide risk screen (positive)</i>		
	<i>AOR (e^B)</i>	<i>CI (95%)</i>	<i>p</i>	<i>AOR (e^B)</i>	<i>CI (95%)</i>	<i>p</i>	<i>AOR (e^B)</i>	<i>CI (95%)</i>	<i>p</i>
Demographic variables									
Age	0.88**	0.84–0.92	0.00	0.92**	0.89–0.95	0.00	0.98	0.95–1.01	0.25
Assigned sex ^a	—	—	—	0.91	0.64–1.30	0.62	0.88	0.62–1.23	0.45
Socioeconomic status	0.92	0.77–1.09	0.33	—	—	—	1.00	0.86–1.15	0.96
Male identity	0.84*	0.71–0.99	0.03	—	—	—	—	—	—
Transgender identity	—	—	—	1.07	0.92–1.25	0.38	1.02	0.88–1.17	0.82
Transsexual identity	—	—	—	—	—	—	1.01	0.87–1.18	0.88
FTM identity	1.04	0.88–1.24	0.67	—	—	—	—	—	—
Third gender identity	1.15	0.96–1.37	0.14	—	—	—	—	—	—
Cross-dresser identity	1.18	0.97–1.42	0.10	—	—	—	—	—	—
Homosexual identity	—	—	—	1.08	0.94–1.23	0.28	—	—	—
Queer identity	—	—	—	1.16*	1.02–1.33	0.03	—	—	—
Pansexual identity	1.08	0.95–1.24	0.25	1.08	0.95–1.23	0.28	1.19**	1.06–1.32	0.01
Not listed SO identity	—	—	—	1.02	0.87–1.21	0.25	—	—	—
Tumblr recruitment	—	—	—	0.84	0.62–1.14	0.37	1.02	0.77–1.34	0.91
Minority Stress Variables									
Gender-related support	1.03	0.96–1.11	0.38	1.03	0.96–1.10	0.41	1.01	0.95–1.07	0.75
Gender-related expression ability	1.03	0.96–1.10	0.44	0.97	0.91–1.05	0.45	1.00	0.94–1.07	0.75
Gender-related self-concept clarity	—	—	—	1.00	0.93–1.08	0.92	—	—	—
Gender-related self-concept negativity	1.02	0.96–1.09	0.58	1.12**	1.19–1.05	0.00	1.09**	1.15–1.03	0.00
Gender-related victimization	1.08*	1.01–1.15	0.04	1.12**	1.03–1.22	0.01	1.15**	1.06–1.25	0.00
SO-related victimization	1.13**	1.05–1.22	0.00	0.97	0.88–1.06	0.45	1.04	0.96–1.14	0.36
Desire for GAMC	1.05	0.98–1.11	0.17	1.02	0.96–1.08	0.59	1.04	0.99–1.09	0.16
GAMC access difficulties	1.01	0.97–1.06	0.66	0.99	0.95–1.03	0.64	1.02	0.98–1.05	0.40
Social Support Variables									
Friend support	0.96*	0.93–.99	0.03	0.99	0.94–1.03	0.58	1.00	0.97–1.03	0.99
Family support	0.99	0.95–1.02	0.50	0.97*	0.94–1.00	0.02	0.98	0.95–1.00	0.10
Depressive Symptoms									
PHQ-9 score (excluding SI)	1.05**	1.01–1.08	0.00	1.18**	1.14–1.22	0.00	1.15**	1.11–1.18	0.00
χ^2	240.36**			412.41**			374.58**		
Df	17			19			17		

^aMale = 0, female = 1, * $p < 0.05$ ** $p < 0.01$.

AOR, adjusted odds ratio; CI, confidence interval; PHQ-9, Patient Health Questionnaire-9; SI, suicide ideation.

In contrast, perceived burdensomeness, but not thwarted belongingness or their interaction, was independently associated with suicide ideation.⁴

More study is needed to explore these relationships further and test alternative models such as the Escape From Self Theory. Given the relationship found between younger age and higher rates of ideation and attempt and the historical dearth of studies with TGNC adolescents and young adults, research addressing this unique developmental context is particularly needed.

Limitations

Although this study's comprehensiveness and size is a relative strength, a number of potential risk and protective factors were not included in the analysis. Discrimination has been linked to suicide in TGNC adult samples,^{13,21,26} although discriminatory experiences relevant to youth have not yet been well conceptualized. Suicide ideation/attempts before the past year, suicide attempt severity (e.g., lethality of attempt), and other predictors identified within the broader literature such as impulsivity, hopelessness, and substance abuse have also been associated with suicide outcomes, but were not included in this study.^{36,37,65} Studies examining trajectories of suicide-related outcomes within TGNC samples have yet to be published, which is critical to elucidating risk factors that prospectively predict these outcomes.

Two limitations relating to the sample composition are important to note. Although Internet-based surveys are helpful at recruiting larger and more geographically diverse samples, participants are more likely to identify as White, which was the case in this study.⁶⁶ Higher rates of participation by individuals AFAB have also been documented in previous Internet-based TGNC samples,^{16,46,67} but this trend is not absolute.^{15,26} Although the factors leading to this imbalance have not yet been explored, they may be related to sociocultural shifts in gender identity development and/or Internet use that impact certain subgroups unevenly within the larger TGNC population. These limitations suggest a number of fruitful avenues for future research.

Conclusion

Within this study, a range of demographic, minority stress, and social support variables cross-sectionally predicted suicide ideation, attempt, and risk. Depressive symptoms and gender-related victimization appeared to make the largest independent contribution, but a significant amount of variance was shared among predictor variables as a whole; and a majority of variance in all three outcomes was left unexplained. Further research is needed, particularly to develop and refine theoretical models of suicide with diverse TGNC populations using longitudinal designs with special attention to the developmental periods of childhood and adolescence. In the meantime, these study findings suggest that prevention and intervention efforts aimed at building support and positive self-concept, decreasing victimization, and treating depression are likely to partially reduce suicide ideation and attempt in TGNC adolescents and young adults.

Acknowledgment

This research was funded by the Dean's Scholars Award presented to Laura Kuper by the University of Illinois at Chicago.

Author Disclosure Statement

No competing financial interests exist.

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