

ORIGINAL ARTICLE

Prevalence and Risk Factors for Nonsuicidal Self-Injury in Transgender and Gender-Expansive Youth at a Rural Gender Wellness Clinic

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Abstract

Purpose: Transgender and gender-expansive (TGE) populations are at increased risk for nonsuicidal self-injury (NSSI). Rural TGE populations are understudied and underserved in terms of mental health services. The purpose of this study was to determine lifetime prevalence of NSSI among TGE youth at a rural gender wellness clinic and identify demographic and clinical characteristics associated with NSSI.

Methods: The Gender Wellness Center Pediatric Patient Registry, a comprehensive database of 185 TGE youth ≤ 25 years of age, provided an estimate of the lifetime prevalence of NSSI. Univariate logistic regression models were utilized to test associations between patient demographic and clinical characteristics and NSSI. Variables that met the threshold for significance in the univariate analyses ($p < 0.05$) were entered into a multivariate logistic regression model. All statistical analyses were conducted in SAS v.9.4.

Results: Prevalence of NSSI in the sample was 36.8% ($n = 68$). In unadjusted logistic regression models, risk factors for NSSI included female assigned sex at birth, transmasculine spectrum gender identity, history of mood disorder, history of suicidal ideation (SI) or attempt, and history of abuse ($p < 0.05$). In the adjusted model, variables significantly associated with NSSI included female assigned sex at birth, history of mood disorder, and history of SI or attempt.

Conclusion: NSSI was highly prevalent in this sample of rural TGE youth, confirming the need for screening and early interventions that target the unique vulnerabilities of TGE youth. The complex interplay of sex assigned at birth, mood disorders, and NSSI requires further research.

Keywords: nonsuicidal self injury; transgender; gender expansive; youth; adolescence

Introduction

Nonsuicidal self-injury (NSSI) is defined as the direct and intentional injury of a person's own body in the absence of suicidal intention or social sanction.^{1,2} NSSI and suicidal ideation (SI) are closely related but functionally unique clinical conditions.^{2,3} NSSI is listed as a disorder in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)*.³⁻⁵ Adolescents have the highest rates of NSSI (up to 17%) followed by young adults (up to 13%) in the U.S. general population.⁶⁻⁹ Transgender and gender-expansive (TGE) populations, particularly youth, are at increased risk for

developing NSSI.^{1,10-12} Three recent studies suggest that the prevalence of NSSI among TGE youth (17% to 52%),¹³⁻¹⁶ is higher than among youth in general.

Clinicians view NSSI among youth as a maladaptive coping strategy for overwhelming emotions such as self-hatred, anxiety, depression, or rejection often related to interpersonal and intrapersonal vulnerabilities.^{17,18} NSSI behaviors in youth may develop as a consequence of adverse childhood events such as maltreatment, abuse, family stress, or dysfunctional peer relationships.^{19,20} Internal factors, including self-esteem and emotional regulation, are closely connected to these external relationships.¹⁹

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Past research demonstrates a connection between NSSI, mood disorders and SI or attempt in general adolescent populations.^{21–24} Studies of TGE youth show that NSSI is associated with many of these same factors, including low self-esteem, mood disorders and SI or attempt.^{15,16}

Recent research suggests that TGE populations have additional, unique vulnerabilities to psychological distress and NSSI. Risk factors for NSSI among TGE individuals include social stigma, minority stress, transphobia, and the challenges of social transition, including family conflict, bullying, and lack of social support.^{1,10,11,15,16,25,26} Experiences of transphobia predict general psychopathology, which, in turn, is a risk factor for NSSI in TGE youth.¹⁵ Adolescence is a critical time for gender identity development when pubertal changes can cause distress and exacerbate gender dysphoria, making youth vulnerable to behaviors such as NSSI and suicide attempt.¹⁴ Previous research identified NSSI as a risk factor for SI and attempt in youth,^{24,27} underlining the importance of screening for these conditions. Some of these risk factors may be amplified by the unique health care disparities faced by rural TGE adults and youth.^{28–30}

No prior studies have examined the link between rurality and NSSI in TGE youth. The purpose of this study was to estimate the prevalence of NSSI and associated factors among TGE youth receiving care at the Gender Wellness Center (GWC), a rural clinic providing primary and gender-affirming medical care to TGE youth and adults in Upstate New York.

Methods

Standard protocol approvals, registrations, and patient consents

The Mary Imogene Bassett Hospital Institutional Review Board approved this study. Youth <18 years of age gave verbal assent to participate, and informed consent was also obtained from a parent or legal guardian. Youth ages 18–25 provided informed consent as legal adults. This study uses clinical data from the GWC Pediatric Patient Registry, which has been described previously.³¹ Study data were collected and managed using REDCap electronic data capture tools hosted at Bassett Medical Center.³²

Subject population

All pediatric and young adult patients (ages 7–25) receiving gender-affirming care, as defined by the World Professional Association for Transgender Health (WPATH) Standards of Care,³³ at the GWC are eligible for inclusion in the GWC Pediatric Patient Registry. Between April

2017 and December 2019, 185 patients were enrolled in the registry and included in this study.

Setting

The GWC is located in Otsego County, NY, which is classified as a nonmetro area, scoring 7 out of 9 in the 2013 Rural–Urban Continuum Code.³⁴ The county includes open countryside, rural towns, a small urban population, and is not adjacent to a metro area.³⁵ The GWC catchment area spans 31 counties across NY State, one county in Pennsylvania, and 112 distinct zip codes. Nearly half of patients reside in rural zip codes with populations <10,000, and two-thirds live in zip codes with populations <20,000.³⁶ Thus, our study population reflects a unique mixture of urban, suburban, and rural TGE youth across a large area of Upstate NY.

Variable definitions

Patient demographic and clinical characteristics. Patient demographic characteristics including age, assigned sex at birth, gender identity, race, ethnicity, and education, were obtained from patients' electronic medical records (EMR) and a survey administered at enrollment. Patients are routinely asked to self-identify in terms of gender identity at each clinic visit. Clinicians are prompted by the EMR to ask patients specific questions and record responses using an EMR template. We used gender identity reported at the most recent visit for this analysis. Social transition was defined as presenting as one's affirmed gender at home and/or in public spaces, including school and the workplace (i.e., through dress and use of preferred pronouns and name). Medical transition was defined as lifetime or current use of Gonadotropin-Releasing Hormone Analogs (GnRH analogs) and/or gender-affirming hormone therapy (GAHT), history of gender-affirming surgery, or a combination.

Mental health history is documented in the EMR by multiple informants and includes current and past diagnoses, and documented history of SI or attempt, psychiatric hospitalization and history of abuse, including emotional, physical, or sexual abuse, or bullying and victimization. To qualify as having a mental health problem in the registry, the problem must have appeared in the patient's EMR in one or more of the following ways: (1) as an International Statistical Classification of Diseases and Related Health Problems (ICD) code³⁷; (2) as a condition on the problem list; (3) noted in a referral letter from a mental health specialist; or (4) documented history in a clinician note. Most youth <18 years of age prescribed GnRH analogs are required to see a therapist

and many undergo a mental health evaluation before GAHT initiation. Additionally, mental health history is regularly reviewed by clinicians as a part of ongoing gender-affirming and primary care. The ICD-10 does not define NSSI as an independent disease entity; rather it is included as a range of self-harm behaviors coded as X71–83.^{3,38} NSSI was abstracted into the registry if self-harm behavior ever appeared in the EMR as an ICD-10 code, a condition on the problem list, in a letter from a mental health specialist or report from a psychiatric institution, or if self-harm behavior was documented in a visit note by a clinician.

Statistical analyses

Differences in patient demographic and clinical characteristics by history of NSSI were tested for significance using the Wilcoxon two-sample test for continuous variables and chi-squared test for categorical variables. Univariate logistic regression models were utilized to test the associations between patient characteristics and history of NSSI. Variables that met the threshold for significance in univariate analysis ($p < 0.05$) were entered into a multivariate logistic regression model. Multicollinearity was evaluated by examining Pearson's correlation coefficient, tolerance, and variance inflation. All analyses were conducted using SAS v.9.4.

Results

Patient demographic and clinical characteristics by history of NSSI

The median age at clinic presentation for the 185 TGE youth enrolled in the GWC Registry was 16.3 years (interquartile range [IQR]: 4.1; range: 6.9–21.8 years). Median age at the most recent clinic visit was 18.6 years (IQR: 5.0; range: 6.9–24.2). The majority of patients were white (89.5%) and non-Hispanic (92.8%). Most youth were currently enrolled in school (56.6% overall; 4.9% elementary, 23.2% middle, 72.0% high school). Among youth not attending school, 60.7% were high school graduates pursuing higher education. Over two-thirds of youth (71.2%) were assigned female sex at birth. Slightly over two-thirds of the sample (68.7%) identified on the transmasculine spectrum (i.e., boy, man, male, trans man, transmasculine), 26.5% identified on the transfeminine spectrum, and 4.9% identified as nonbinary (NB) or gender nonconforming (GNC). Nearly all youth had socially transitioned (89.4%) and were medically transitioning (86.0%). Among youth who were medically transitioning, 30.8% had lifetime or current use of GnRH ana-

logs, 74.6% had lifetime or current use of GAHT, and 10.8% had a gender-affirming surgical procedure.

Table 1 presents the characteristics of the sample stratified history of NSSI. There were no statistically significant differences in age at clinic presentation, age at most recent clinic visit, race, ethnicity, social transition

Table 1. Characteristics of the Study Sample Stratified by History of Nonsuicidal Self-Injury

Characteristic, <i>n</i> (column %)*	History of NSSI (<i>N</i> = 185)		<i>p</i> [†]
	Yes (<i>n</i> = 68)	No (<i>n</i> = 117)	
Age (years) at clinic presentation, median (IQR)	16.3 (4.1)	16.2 (4.0)	0.837
Age (years) at most recent clinic visit, median (IQR)	19.0 (4.8)	18.4 (5.0)	0.665
Assigned sex at birth ^a			<0.001
Male	9 (13.4)	44 (37.6)	
Female	58 (86.6)	73 (62.4)	
Gender identity			0.004
Transmasculine spectrum	54 (79.4)	73 (62.4)	
Transfeminine spectrum	9 (13.2)	40 (34.2)	
Nonbinary/gender nonconforming	5 (7.4)	4 (3.4)	
Race			0.677
White or Caucasian	59 (90.8)	103 (88.8)	
Non-White	6 (9.2)	13 (11.2)	
Ethnicity			0.295
Hispanic or Latino	7 (11.1)	7 (6.5)	
Non-Hispanic or Latino	56 (88.9)	100 (93.5)	
Socially transitioned ^b			0.207
Yes	61 (93.9)	99 (86.8)	
No	4 (6.2)	15 (13.2)	
Medically transitioning ^c			0.119
Yes	62 (91.2)	97 (82.9)	
No	6 (8.8)	20 (17.1)	
Rural zip code residence ^d			0.125
Yes	37 (54.4)	50 (42.7)	
No	31 (45.6)	67 (57.3)	
Nonmetro county residence ^e			0.534
Yes	16 (23.5)	23 (19.7)	
No	52 (76.5)	94 (80.3)	

Boldface indicates values which were significantly associated with history of NSSI.

*Numbers may not sum to totals due to missing data and column percentages may not sum to 100% due to rounding.

[†]*p*-Value for Wilcoxon two-sample test (continuous variables) or χ^2 test (categorical variables); Fisher's exact test was utilized when the sample count in a given category was < 5.

^aOne intersex patient was excluded from the analysis of the variable assigned sex at birth.

^bSocial transition was defined as presenting as one's affirmed gender at home and/or in public spaces, including school and the workplace (i.e., through dress and use of preferred pronouns and name).

^cMedical transition was defined as lifetime or current use of GnRH analogs and/or GAHT, and/or history of gender-affirming surgery.

^dZip code with a population < 10,000.³³

^eCounty that includes some combination of open countryside, rural towns (< 2500 people), and urban areas with populations < 50,000 that are not part of larger metropolitan areas.³³

GAHT, gender-affirming hormone therapy; GnRH analogs, Gonadotropin-Releasing Hormone Analogs; NSSI, nonsuicidal self-injury.

status, medical transition status, rural zip code residence, or nonmetro country residence between the two groups. A greater proportion of patients with a history of NSSI were assigned females at birth (86.6% assigned female vs. 13.4% assigned male, $p < 0.001$). Correspondingly, a greater proportion of patients with a history of NSSI had transmasculine spectrum gender identities (79.4% transmasculine spectrum vs. 13.2% transfeminine spectrum and 7.4% NB/GNC).

Mental health. Mental health variables differed significantly by history of NSSI (Table 2). Among patients with a history of NSSI, 83.8% had history of depression or other mood disorder, compared with 47.9% of patients with no history of NSSI ($p < 0.001$). SI or attempt was highly prevalent and over twice as common among patients with a history of NSSI compared with patients with no history of NSSI (76.5% vs. 29.9%, $p < 0.001$). Nearly half of patients with a history of NSSI had been hospitalized at a psychiatric institution (47.1%) compared with 16.2% of patients with no history of NSSI ($p < 0.001$). History of abuse was also significantly more prevalent among patients with a history of NSSI (46.3% vs. 29.9%, $p = 0.026$). History of anxiety disorder (affecting 42.2% of youth overall), was present among half of youth with a history of NSSI (51.5%) and

36.8% of youth without, however, this difference did not meet the threshold for significance ($p = 0.051$).

Prevalence and risk factors for NSSI. Overall prevalence of NSSI in the sample was 36.8% ($n = 68$). Cutting was the most common type of NSSI, reported by 86.8% of subjects engaging in self-injurious behaviors. Burning was the second most common behavior (10.3%). Other types of self-injurious behaviors affecting one to two subjects each included self-bruising, trichotillomania, scratching, and excoriation. Nine subjects engaged in multiple behaviors.

Univariate logistic regression models tested the associations between NSSI and the following variables: age, assigned sex at birth, gender identity, race, ethnicity, social and medical transition status, rural zip code residence, nonmetro country residence, history of anxiety disorder, history of mood disorder, history of SI or attempt, and history of abuse (Table 3). Five variables were significantly associated with history of NSSI: female assigned sex at birth (44.3% had a history of NSSI vs. 17.0% of assigned males; unadjusted odds ratio [OR] 3.88, 95% confidence interval [CI, 1.75–8.61], $p < 0.001$); transmasculine spectrum gender identity (42.5% NSSI vs. 18.4% among transfeminine spectrum-identified individuals; unadjusted OR 3.29, 95% CI [1.47–7.35], $p = 0.004$); history of mood disorder (50.4% NSSI vs. 15.3%; unadjusted OR 5.64, 95% CI [2.69–11.83], $p < 0.001$); positive history of SI or attempt (59.8% NSSI vs. 16.3%; unadjusted OR 7.61, 95% CI [3.83–15.12], $p < 0.001$); and positive history of abuse (47.0% NSSI vs. 30.5%; unadjusted OR 2.02 [1.08–3.76], $p = 0.027$). History of anxiety disorder and NSSI were marginally associated (44.9% NSSI vs. 30.8%; unadjusted OR 1.83, 95% CI [1.00–3.35], $p = 0.052$). Age, race, ethnicity, social transition status, medical transition status, rural zip code residence, and nonmetro country residence were not significantly associated with history of NSSI (Table 3).

Four of the five variables that were significant in the unadjusted univariate analyses were entered into the multivariate model (Table 3). Gender identity was excluded from the adjusted model due to a high degree of collinearity with assigned sex at birth. Controlling for all other variables, three factors remained significant in the multivariate model: female assigned sex at birth, diagnosis of mood disorder, and history of SI or attempt. The odds of NSSI were over four times greater among assigned females compared with among assigned males (adjusted odds ratio [aOR] 4.56, 95% CI [1.80–11.52], $p = 0.001$). The odds of NSSI were also over three times greater among patients with a history of mood disorder

Table 2. Mental Health Characteristics of the Sample Stratified by History of Nonsuicidal Self-Injury

Characteristic, <i>n</i> (column %)*	History of NSSI (<i>N</i> = 185)		<i>p</i> [†]
	Yes (<i>n</i> = 68)	No (<i>n</i> = 117)	
History of anxiety disorder			0.051
Yes	35 (51.5)	43 (36.8)	
No	33 (48.5)	74 (63.3)	
History of mood disorder			<0.001
Yes	57 (83.8)	56 (47.9)	
No	11 (16.2)	61 (52.1)	
History of suicidal ideation or attempt			<0.001
Yes	52 (76.5)	35 (29.9)	
No	16 (23.5)	82 (70.1)	
History of psychiatric hospitalization			<0.001
Yes	32 (47.1)	19 (16.2)	
No	36 (52.9)	98 (83.8)	
History of abuse [‡]			0.026
Yes	31 (46.3)	35 (29.9)	
No	36 (53.7)	82 (70.1)	

*Table values are *n* (column %); numbers may not sum to totals due to missing data and column percentages may not sum to 100% due to rounding

[†]*p*-Value for χ^2 test (categorical variables).

[‡]Includes documented physical, emotional, or sexual abuse or bullying/victimization.

Table 3. Univariate and Multivariate Associations Between Study Variables and Nonsuicidal Self-Injury

Variable	n ^a	NSSI %	Unadjusted model (N=185)		Adjusted model (N=183)	
			OR (95% CI)	p	OR (95% CI)	p
Age (years) ^a						
< 14	66	39.4	1.00	—		
15–17	49	30.6	0.68 (0.31–1.49)	0.332		
18–25	70	38.6	0.97 (0.49–1.93)	0.922		
Assigned sex at birth ^b						
Male	53	17.0	1.00	—	1.00	—
Female	131	44.3	3.88 (1.75–8.61)	<0.001	4.56 (1.80–11.52)	0.001
Gender identity ^c						
Transfeminine spectrum	49	18.4	1.00	—		
Transmasculine spectrum	127	42.5	3.29 (1.47–7.35)	0.004		
Race						
White or Caucasian	162	36.4	1.00	—		
Non-White	19	31.6	0.81 (0.29–2.23)	0.678		
Ethnicity						
Non-Hispanic or Latino	156	35.9	1.00	—		
Hispanic or Latino	14	50.0	1.78 (0.60–5.35)	0.301		
Socially transitioned ^d						
No	19	21.1	1.00	—		
Yes	160	38.1	2.31 (0.73–7.28)	0.153		
Medically transitioning ^e						
No	26	23.1	1.00	—		
Yes	159	39.0	2.13 (0.81–5.60)	0.125		
Rural zip code residence ^f						
No	98	31.6	1.00	—		
Yes	87	42.5	1.60 (0.88–2.92)	0.126		
Nonmetro county residence ^g						
No	146	35.6	1.00	—		
Yes	39	41.0	1.26 (0.61–2.59)	0.534		
History of anxiety						
No	107	30.8	1.00	—		
Yes	78	44.9	1.83 (1.00–3.35)	0.052		
History of mood disorder						
No	72	15.3	1.00	—	1.00	—
Yes	113	50.4	5.64 (2.69–11.83)	<0.001	3.68 (1.54–8.79)	0.003
History of suicidal ideation or attempt						
No	98	16.3	1.00	—	1.00	—
Yes	87	59.8	7.61 (3.83–15.12)	<0.001	5.59 (2.62–11.93)	<0.001
History of abuse ^h						
No	118	30.5	1.00	—	1.00	—
Yes	66	47.0	2.02 (1.08–3.76)	0.027	0.99 (0.46–2.13)	0.975

^aAge reflects subject age at the most recent clinic visit (the last visit captured in the registry).

^bOne intersex patient was excluded from both the univariate and multivariate analyses.

^cNB/GNC youth were excluded from the gender identity variable due to the small sample of youth represented in this gender identity subcategory (n=9), which resulted in unstable ORs. The gender identity variable was ultimately excluded from the multivariate, adjusted model due to a high degree of collinearity with the variable assigned sex at birth.

^dSocial transition was defined as presenting as one's affirmed gender at home and/or in public spaces, including school and the workplace (i.e., through dress and use of preferred pronouns and name).

^eMedical transition was defined as lifetime or current use of GnRH analogs and/or GAHT, and/or history of gender-affirming surgery.

^fZip code with a population < 10,000.³³

^gCounty that includes some combination of open countryside, rural towns (< 2500 people), and urban areas with populations < 50,000 that are not part of larger metropolitan areas.³³

^hHistory of abuse included any history of physical, sexual, or emotional abuse or bullying/victimization.

CI, confidence interval; GNC, gender nonconforming; NB, nonbinary; OR, odds ratio.

compared with those without (aOR 3.68, 95% CI [1.54–8.79], $p=0.003$). The odds of NSSI were over five times greater among patients with a history of SI or attempt compared with those without (aOR 5.59, 95% CI [2.62–11.93], $p<0.001$).

Discussion

This study examines the prevalence of NSSI and its associated risk factors in a sample of TGE youth seeking gender-affirming care at a rural gender wellness clinic. Over one-third of patients in our sample had a history

of NSSI ($n=68$; 36.8%). This high prevalence is in agreement with past research on cohorts of TGE youth,^{13–16,39} and significantly higher than the prevalence among U.S. adolescents estimated in a recent meta-analysis (17.2%).⁶

Our results demonstrate a link between NSSI and mood disorders. The high prevalence of NSSI seen in TGE youth may reflect the higher prevalences of depression and other mood disorders in TGE populations.¹¹ The Gender Minority Stress Model suggests that higher rates of depression and other mood disorders among TGE cohorts can be attributed to psychological distress, gender identity-based discrimination and experiences of stigma.^{40–42} Arcelus et al. described the connection between experiences of discrimination, mood disorders, and NSSI behavior and found that the experiences of transphobia predicted general psychopathology, which was, in turn, associated with NSSI behavior.¹⁵ However, not all TGE youth who engage in NSSI have a mood or anxiety disorder. Past research shows that interpersonal functioning and lack of social supports, such as parental connectedness and safety in school, are also associated with NSSI.^{1,16} A recent qualitative research study of transmasculine individuals suggested that minority stress and the stress of identity development increased vulnerability for NSSI, and that for some participants NSSI served to regulate emotions and cope when external social supports were unavailable.⁴³

The association between female assigned sex at birth and NSSI is concordant with past research in TGE cohorts.^{14,15} This association also exists in the general population, however, the reasons underlying the dynamics remain unclear. Several studies have documented the unequitable prevalence of NSSI among cisgender women versus men.^{6,44,45} Some studies that have demonstrated a link between female sex and NSSI behavior have suggested that biological influences may play a role in the development of NSSI.^{11,45} Swannell et al. suggest that the higher prevalence of NSSI documented in cisgender women is due to a higher likelihood of engagement in stereotypical forms of self-injury such as cutting, which are more likely to be identified and documented by clinicians and captured in NSSI surveys.⁶ Sociocultural factors, such as gendered socialization toward different methods of emotional regulation in early childhood, may also play a role in the higher prevalence of NSSI among cisgender women.⁴⁵ We hypothesize that a combination of sociocultural factors and awareness of stereotypical forms of self-harm behaviors may account for the association between

NSSI and sex assigned at birth observed in this study. Due to the limitations of our study, further inferences cannot be made. However, future investigation of this association could elucidate gaps in screening for different forms of NSSI or provide clues as to the functional underpinning of NSSI.

The association between NSSI and SI and attempt is supported by prior research of TGE and general community samples.^{21,46–48} Although instances of NSSI may be mistaken for a suicide attempt, NSSI and suicide attempts differ in their intention and functionality.⁴⁶ Unlike suicide attempts, NSSI is not committed with the intent to end one's life but to relieve or communicate emotional distress.^{46,49} However, Klonsky et al. found that NSSI and SI were stronger risk factors for suicide than depression, anxiety, impulsivity, or borderline personality disorder, and stated that "NSSI may be a uniquely important risk factor for suicide because its presence is associated with both increased desire and capability."²⁴

Multiple theories have sought to explain the connection between NSSI and suicide.^{46,50} As a part of the interpersonal theory of suicide, Joiner (2007) suggested that NSSI increases risk of suicide attempt by increasing a person's 'acquired capability for suicide.'⁵¹ That is, through habituation to the fear and pain associated with self-harm, a person may become desensitized to the fear associated with taking one's own life.^{46,51} Our study suggests that recognizing NSSI may be useful in identifying youth who are most at risk for future SI and attempts and emphasizes the importance of counseling patients on the risks associated with self-harm behaviors. The rates of SI and attempt are high in this and other samples of TGE individuals,⁵² and additional research is needed to fully understand the risk factors and identify opportunities for intervention.

Our results did not demonstrate an association between rural residence and NSSI, and instead reflected a high rate of NSSI among TGE youth across different community settings. Health and health care access disparities exist for rural transgender youth and adults compared with nonrural cohorts.^{28,30,53} However, no prior studies have specifically compared the prevalence of NSSI among rural and nonrural TGE youth. Our results could reflect that some health disparities associated with rural residence, such as difficulty accessing mental health care resources, are felt by both rural and nonrural youth in the region served by the GWC. Further research is needed to elucidate the relationship between NSSI and rural residence. Overall, this result emphasizes

the importance of screening youth for NSSI behavior across all types of residency locations.

Limitations

Patients may withhold information about NSSI from clinicians and may intentionally hide evidence of NSSI. Clinicians vary in their methods of eliciting and documenting both NSSI behaviors and general mental health history and patients vary in their access to and utilization of mental health resources. The prevalence of NSSI is likely underestimated in this sample due to the inherent limitations associated with the use of EMR for mental health research and the existence of rural mental health disparities.

Our study is also subject to selection bias due to its clinic-derived sample of youth seeking gender-affirming care. Accessing clinical services at the GWC requires parental support (in most cases) as well as health insurance and transportation, both of which are major barriers to health care access in rural areas. While our sample is derived from a rural clinic, our study population was not exclusively rural. The study population is predominately white, which reflects the lack of racial and ethnic diversity in this region of NY. It may also indicate increased barriers to health care affecting TGE people of color, including a higher degree of economic and personal discrimination, and disparate access to health insurance.⁵⁴ For these reasons, our results may not be generalizable to the TGE youth population in other areas.

Conclusions

NSSI is a significant health concern for TGE youth. NSSI in TGE youth is the nexus of a complex web of social factors such as discrimination and family rejection, developmental factors, including maladaptive coping strategies common to youth, and internal factors, including the effect of pubertal changes on gender identity and dysphoria. The results of this study underscore need for NSSI screening and the importance of mental health services. Given the associations between mood disorders and NSSI, and SI and NSSI, mental health professionals and clinicians should be trained to address NSSI risk factors specific to TGE youth. Further research is needed to understand the complex interplay of sex assigned at birth, mood disorders, and external factors including minority stress, social support, and rurality in the development of NSSI in TGE youth.

Author Disclosure Statement

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Abbreviations Used

aOR	= adjusted odds ratio
CI	= confidence interval
DSM-5	= Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
EMR	= electronic medical records
GAHT	= gender-affirming hormone therapy
GNC	= gender nonconforming
GnRH analogs	= Gonadotropin-Releasing Hormone Analogs
GWC	= Gender Wellness Center
ICD	= International Statistical Classification of Diseases and Related Health Problems
IQR	= interquartile range
NB	= nonbinary
NSSI	= nonsuicidal self-injury
OR	= odds ratio
SI	= suicidal ideation
TGE	= transgender and gender expansive