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Social Support and Mental Health Among Transgender and Nonbinary Youth in Quebec

Kira London-Nadeau, MSc,^{1,2} Nicholas Chadi, MD, MPH,^{2–4} Ashley B. Taylor, PhD,⁵ Ace Chan, MSc,⁵ Annie Pullen Sansfaçon, PhD,^{6,7} Lyne Chiniara, MD, MA,⁸ Claire Lefebvre, MD, MSc,³ and Elizabeth M. Saewyc, PhD⁵

Abstract

Purpose: Transgender and nonbinary (TNB) youth face elevated levels of discrimination, stigma, mental health disorders, and suicidality when compared with their cisgender counterparts. Family and school support may mitigate some of the effects of the stressors facing TNB youth. This study aimed to better understand the impact of each of these sources of support on TNB youths' mental health and wellbeing.

Methods: We used data collected between 2018 and 2019 as part of the Canadian Trans Youth Health Survey, a bilingual online survey to measure social support, physical health, and mental health in a sample of 220 TNB youth aged 14–25 living in Québec, Canada. We examined the relationships among different sources of support, and mental health and wellbeing outcomes using logistic regression. Analyses were conducted on the full sample and according to linguistic groups (French and English).

Results: Participants reported high levels of mental health symptoms, self-harm, and suicidality, and mental health symptoms were higher in the English-speaking group (p=0.005). In models controlling for age, family connectedness was associated with good/excellent self-reported mental health (odds ratio [OR]=2.62, p=0.001) and lower odds of having considered suicide (OR=0.49, p=0.003) or attempted suicide (OR=0.43, p=0.002), whereas school connectedness was associated with higher odds of good/very good/excellent general (OR=2.42, p=0.013) and good/excellent mental (OR=2.45, p=0.045) health.

Conclusion: Family and school support present consistent associations with TNB youths' health and may constitute key areas for intervention for those supporting them.

Keywords: mental health, nonbinary, Québec, social support, transgender, youth

Introduction

THE LITERATURE ON THE HEALTH and wellbeing of transgender and nonbinary (TNB) youth (i.e., youth whose gender does not align with their sex assigned at birth) is growing fast and it is already well-established that this group faces increased levels of stigma, discrimination, and barriers in access to health services compared with cisgender youth.^{1–3} It has been suggested that this may at least in part be a reflection of cultural norms around gender, transphobia, and cisnormativity (the assumption of and construction of society around cisgender identities).^{4,5}

These realities are reflected in TNB youth experiencing poorer mental health outcomes such as high rates of suicidal

¹Department of Psychology, Université de Montréal, Montréal, Québec, Canada.

²CHU Sainte-Justine Research Center, Montréal, Québec, Canada.

³Division of General Pediatrics, Department of Pediatrics, CHU Sainte-Justine, Université de Montréal, Montréal, Québec, Canada.

⁴Division of Adolescent Medicine, Department of Pediatrics, CHU Sainte-Justine, Université de Montréal, Montréal, Québec, Canada.

⁵Stigma and Resilience Among Vulnerable Youth Centre, School of Nursing, University of British Columbia, Vancouver, British Columbia, Canada.

⁶Canada Research Chair on Transgender Children and their Families, School of Social Work, Université de Montréal, Montréal, Québec, Canada.

⁷School of Social Work, Stellenbosch University, Stellenbosch, South Africa.

⁸Division of Endocrinology, Department of Pediatrics, CHU Sainte-Justine, Université de Montréal, Montréal, Québec, Canada.

ideation and suicide attempts,^{6–8} as well as elevated levels of mental health comorbidities and self harm compared with cisgender youth.^{7–12} In addition, it is crucial to better understand the experiences of TNB youth as this group experiences exacerbated marginalization and stressors that lead to further disparities in mental health and wellbeing compared with their sexually diverse cisgender counterparts.^{13,14}

In addition to the structural and institutional stressors that TNB youth face, different sources of support—or lack thereof—can play a crucial role in affecting the mental health of this group. Lack of support, rejection, and victimization from those close to TNB youth, including parents, family, and peers, have consistently been linked to mental distress and suicidality.^{5,6,15–17} Conversely, enacted support from these social groups may have protective effects on the mental health of TNB youth, at times even mitigating the effects of structural and institutional stressors.^{5,18–20}

Nonetheless, although social support can be conceptualized as a general experience, different sources and levels of social support may have differential influence on TNB youth wellbeing.²¹ In particular, differences have been reported between support from friends, family, significant others, and school peers. For example, a study of suicide risk among transgender adults found that out of friend, family, and significant other support, only friend support was a significant predictor of depression, which in turn fully mediated the relationship with suicide risk.²² School contexts may also play a key role in the mental health of TNB youth, whereby victimization and, conversely, school safety and belonging predict mental health outcomes.^{23,24}

Family support has also been reported as a particularly impactful source of support in the lives of TNB youth.^{1,25,26} Indeed, a study of 154 TNB youth found that, although family support was associated with living in their felt gender, a key predictor of TNB individuals' mental health,^{27–31} the association was not significant for friend and significant other support.²⁵ A study of transgender girls and women aged 16-24 years provided additional evidence for the importance of family and parental support, reporting that, among various sources of social support, parental closeness was the most consistent mitigator of mental health disorders and psychological distress.³² In another study of trans youth, family functioning was linked to better mental health outcomes but only for self-reported (and not caregiver- nor sibling-reported) measures, highlighting the importance of how family functioning is felt and experienced by TNB youth themselves.33

It is also important to take into consideration the nature and quality of the support. For instance, a recent mixedmethods study examining the experiences of support of TNB youth notes the distinction between social acceptance and support, namely that support goes further than acceptance, as it must be accompanied by action.²⁵ Although acceptance is appreciated, the inclusion of tangible actions is crucial for TNB youth to truly feel supported.²⁵ Parents and other family members and caregivers may be well-versed and equipped to provide general support, yet still struggle when it comes to recognition and support specifically around issues linked to gender.^{34,35}

Language use is also important for the well being, support, and social validation of TNB youth.³⁶ The use of correct and chosen terminology when referring to TNB youth (e.g., the use of proper pronouns and name), as well as gender affirma-

tion through, for example, gender-concordant identification, has been linked to reduction in mental health distress and suicidality.^{5,37–39} TNB youth may also have different experiences with discrimination or inclusion based on the languages they speak, as different languages conceptualize and describe gender in vastly different ways.⁴⁰ In particular, more gendered languages such as French, Spanish, German, and Arabic present additional barriers to the use of gender neutral language, which subsequently affects the lived experience of TNB individuals.^{40–42} Although gender neutral terms exist,⁴³ navigating the establishment of meaningful terms that are applicable to various situations and age groups remains a challenge in Québec, specifically for French-speaking TNB individuals.⁴⁴

This study sought to examine the relationship between different sources of support, specifically family and school support, and various measures of wellbeing including mental and general health outcomes, and suicidality in TNB youth. More specifically, we aimed to compare the experiences of TNB youth living in Québec and evolving in two different linguistic contexts, namely French-speaking and English-speaking communities.

Methods

The data for this study were collected from November 1, 2018 to May 31, 2019 as part of the second iteration of the Canadian Trans Youth Health Survey (CTYHS) (N=1519 respondents).⁴⁵ The CTYHS is implemented by a network of researchers, community organizations, and youth advisory groups and seeks to better understand the realities of TNB youth across Canada. This study includes only the responses from participants in Québec, a bilingual (English/French) province. After obtainment of informed consent, participants completed the voluntary and anonymous online survey in English or French.

The survey posed questions about participants' sociodemographic information, gender identity and experiences, general and mental health, social and linguistic contexts, and other factors that may influence participants' health. Ethics approval was obtained from the following University Research Ethics Boards: (1) University of British Columbia, certificate No. H18-00808; (2) Wilfrid Laurier University, certificate No. 5880; (3) MacEwan University, certificate No. 101561; (4) University of Manitoba, certificate No. P2018:113 (HS22237); (5) University of Montreal, certificate No. CERAS-2018-19-202-D; (6) University of Waikato; and (7) University of Winnipeg, certificate No. GT923-Multi-site UBC.

Participants

The sample for this study included the 220 participants of the CTYHS 2019 who were living in Québec. Participants were aged 14–25 years and self-identified as trans or nonbinary. The survey was shared through the researchers' networks, online advertisements and social media announcements, and Canadian lesbian, gay, bisexual, transgender and queer (LGBTQ) and transgender-specific community organizations. Although age was collected as a continuous variable, participants were sorted into dichotomous age groups (14–18 years and 19–25 years). More participants were in the older age group (n=151, 68.6%) than in the younger

| | <i>Full sample</i> (n=220), n (%) | <i>French</i> (n=156; 70.9%), n (%) | <i>English</i> (n=64; 29.1%), n (%) | Sig. |
|--------------------------------------|--------------------------------------|--|--|-------|
| Age, years | | | | |
| 14–18 | 69 (31.4) | 52 (33.3) | 17 (26.6) | 0.056 |
| 19–25 | 151 (68.6) | 104 (66.7) | 47 (73.4) | |
| Ethnicity | | | | |
| White | 193 (88.1) | 140 (90.3) | 53 (82.8) | |
| White only | 181 (82.3) | 137 (87.8) | 44 (68.8) | |
| BIPOC | 39 (17.7) | 19 (12.2) | 20 (31.3) | 0.001 |
| Indigenous | 12 (5.5) | 6 (3.9) | 6 (9.4) | |
| Black | 6 (2.7) | ** | ** | |
| Central or South American | 9 (4.1) | ** | ** | |
| West Asian or Arab | 7 (3.2) | ** | ** | |
| Other race/ethnicity or I don't know | 11 (5) | ** | ** | |
| Gender identity | | | | |
| Trans binary | 136 (61.8) | 106 (67.9) | 30 (46.9) | 0.003 |
| Trans boy/man | 106 (48.2) | | | |
| Trans girl/woman | 30 (13.6) | | | |
| Nonbinary | 84 (38.2) | 50 (32.1) | 34 (53.1) | |
| Living in felt gender | | | | |
| Yes, at least part-time | 145 (90.1) | 101 (91.0) | 44 (88.0) | 0.557 |
| Use of affirmed pronouns | | | · · · · · | |
| Yes | 133 (82.6) | 94 (84.7) | 39 (78.0) | 0.300 |
| | 155 (62.0) |)+ (0+.7) | 55 (78.0) | 0.500 |
| Legal name change | 01(40,0) | 50 (51 2) | 22(42,1) | 0 221 |
| Yes | 81 (48.8) | 59 (51.3) | 22 (43.1) | 0.331 |
| Family connectedness | 2 44 (25 0 50) | 2.50 | 2.20 | 0.110 |
| Mean score | 3.44 (SD = 0.78) | 3.50 | 3.30 | 0.119 |
| School connectedness | | | | |
| Mean score | 2.88 (SD = 0.61) | 2.95 | 2.75 | 0.090 |
| Safety at home | | | | |
| Never | 4 (2.5) | 3 (2.7) | 1 (2.0) | 0.824 |
| Rarely | 4 (2.5) | 3 (2.7) | 1 (2.0) | |
| Sometimes | 23 (14.3) | 14 (12.6) | 9 (18.0) | |
| Often | 130 (80.7) | 91 (82.0) | 39 (78.0) | |
| Government care services involvement | . , | | · · · | |
| At least once | 16 (7.5) | 11 (7.2) | 5 (8.2) | 0.810 |

TABLE 1. PARTICIPANT SOCIODEMOGRAPHIC AND CLINICAL CHARACTERISTICS BY LINGUISTIC GROUP

Statistics are presented as column percentages of the presented variable both in the full sample and in each of the French- and English-speaking subsamples. The number of participants corresponding to each column percentage is presented in parentheses. To ensure participant confidentiality, cells containing n < 5 are masked using two asterisks (**). Significant differences are given in bold. Participants could select more than one ethnicity.

BIPOC, Black, Indigenous, and people of color; SD, standard deviation.

group (n = 69, 31.4%). Demographic information on the sample's ethnic distribution, gender identity and affirmation markers, home situation, health, and exposure to abuse and violence is provided in Table 1.

Measures

Questions were primarily drawn from validated measures in well-established school-based population surveys such as the British Columbia Adolescent Health Survey, the Ontario Student Drug Use and Health Survey, and the U.S. National Longitudinal Study of Adolescent to Adult Health or ADD Health, as well as items specific to gender-related experiences adapted from trans and nonbinary adult surveys and youth clinical measures.

Sociodemographic characteristics

In addition to being separated into younger/older age groups, participants self-identified the ethnic group(s) with which they were associated, by responding to the question "Which of the following best describes your background? Mark all that apply. Are you...?" Participants also indicated their preferred spoken language (English or French).

Gender identity and expression

The CTYHS asked a variety of questions about gender identity. For these analyses, participants were asked "Which one response best describes you?" with response options as (1) I am transgender and identify as a boy or man, (2) I am transgender and identify as a girl or woman, (3) I am transgender and identify in some other way, (4) I am not transgender. For the present analyses, options 1 and 2 were coded as binary trans, and options 3 and 4 were coded as nonbinary. Participants were also asked about gender-affirming experiences including living in their felt gender, having changed their legal name, and others using their affirmed name/ pronoun (by answering the question "In your day-to-day life, do you use a different name or pronoun from the one that you were given at birth, one that better reflects your gender identity?" Answer options were yes/no).

Home safety

Participants' security at home was measured by asking: "Please mark how often you feel safe inside your home." Lifetime involvement with youth protection services was also reported.

General and mental health

General physical health was assessed by asking participants to rate their health (dichotomized as poor/fair vs. good/very good/excellent), to report on any chronic physical health conditions (a condition that lasted at least 12 months), and to report on sleep problems ("How often do you have trouble going to sleep or staying asleep"). Mental health was assessed through a general rating (dichotomized as poor/ fair vs. good/excellent) and report of mental/emotional health conditions lasting at least 12 months, as well as by asking participants about self-harm ("How often did you self-harm in the past 12 months?"), and suicidal ideation ("During the past 12 months, did you ever seriously consider killing yourself?") and suicide attempts ("During the past 12 months, how many times did you actually try to kill yourself?").

School and family connectedness

School connectedness was measured using the School Connectedness Scale,⁴⁶ which uses a 4-point scale ("strongly disagree" to "strongly agree") to measure feelings of belonging, engagement, and connection to one's school (e.g., "I feel safe in my school"). Family connectedness was measured using the Family Connectedness Scale from the British Columbia Adolescent Health Survey and the Minnesota Student Survey with items such as "How much do you feel that your family understands you?" Parental closeness was also included in family connectedness using the Parent Connectedness Scale,⁴⁷ which assesses closeness and perceptions of caring from mother and father (as defined by the participant) dichotomized as "not at all/very little" versus "quite a bit/very much."

Analyses

Analyses were conducted using SPSS version 26. Sample size varied from one question to another depending on missing data. Descriptive data are reported as absolute numbers and valid percentages to account for varying levels of missing data. T tests were used to compare mean scores of continuous variables between linguistic groups, whereas chi-square tests were used to test the difference between groups for categorical variables. Binary (including one predictor at a time) and multivariate logistic regressions (including one predictor at a time and controlling for age as a continuous variable) were used to examine the relationships between various sources of support and health outcomes. Due to limited sample size, logistic regressions were not stratified by linguistic group.

Results

Demographic information

Descriptive statistics for the sample are given in Table 1. The sample was predominantly of White ethnicity, with about one-third at ages 18 or younger and two-thirds at ages 19–25. The largest group (48.2%) identified as trans boys/men, and the smallest group as trans girls/women (13.6%). Most of the participants answered being in a safe environment at home (80.7%). Mean scores for family and school connectedness were 3.44/5 (standard deviation [SD]=0.78) and 2.88/4 (SD=0.61), respectively, and did not differ significantly by linguistic group. A substantial minority of participants reported difficult life experiences, including having lived in government care (7.5%).

The ethnicity and identity distribution varied by linguistic group (Table 1), with the English-speaking group containing a significantly higher proportion of youth who were Black, Indigenous, and people of color (BIPOC; 31.3% vs. 12.2%) as well as nonbinary youth (53.1% vs. 32.1%).

Health measures

Table 2 presents the health measures for the full sample and compared by linguistic groups. A majority of participants experienced good physical health, although a considerable minority reported having poor/fair general health (25%), living with a chronic physical health condition (35%), and often experiencing trouble sleeping (42.9%). Most health and well-being scores were similarly distributed among the French- and English-speaking groups, with the exception of general mental health, for which the Englishspeaking participants were more likely to experience poor or fair mental health than those in the French-speaking group (92% vs. 72.1%). The high prevalence of self-rated poor or fair mental health contrasted markedly with lower prevalence of poor or fair physical health ratings (31.6% and 22.4% in the English- and French-speaking groups, respectively). Past-year self-harm was common (57.5% of the full sample), as was suicidality, with a considerable proportion of the sample having considered (55.6%) or attempted (20.6%) suicide in the past 12 months.

Associations between family and school support and adverse mental health outcomes

In the bivariate logistic regressions, family connectedness was significantly associated with better odds of self-rated mental health, and lower odds of self-harm, and considering or attempting suicide. School connectedness was significantly associated with higher odds of good or excellent general health and mental health (results available upon request). Table 3 presents the results of the multivariate logistic regression models that included family and school connectedness and age as outcome predictors, with one predictor (family or school connectedness) per model. When controlling for age, family connectedness was associated with higher odds of good or excellent mental health and lower odds of having considered or attempted suicide. When controlling for age, school connectedness was associated with higher odds of good or excellent general physical and mental health.

| | <i>Full sample</i> (n=220), n (%) | <i>French</i> (n=156; 70.9%), n (%) | <i>English</i> (n=64; 29.1%), n (%) | Sig. |
|--|--------------------------------------|--|--|-------|
| Health in general | | | | |
| Poor/fair | 50 (25) | 32 (22.4) | 18 (31.6) | 0.175 |
| Good/very good/excellent | 150 (75) | 111 (77.6) | 39 (68.4) | |
| Physical health condition, >12 months (yes) | 69 (35) | 54 (38.3) | 15 (26.8) | 0.127 |
| Sleep trouble | | | | |
| Never | 11 (6.8) | 9 (8.1) | 2 (4.0) | 0.176 |
| Rarely | 22 (13.7) | 11 (9.9) | 11 (22.0) | |
| Often | 69 (42.9) | 50 (45.0) | 19 (38.0) | |
| Always | 59 (36.6) | 41 (36.9) | 18 (36.0) | |
| Mental/emotional health condition >12 months (yes) General mental health | 154 (78.2) | 108 (76.6) | 46 (82.1) | 0.395 |
| Poor/fair | 126 (78.3) | 80 (72.1) | 46 (02 0) | 0.005 |
| Good/excellent | 35 (21.7) | 31 (27.9) | 46 (92.0) 4 (8.0) | 0.005 |
| Self-harm past 12 months (ever) | 92 (57.5) | 68 (61.8) | 24 (48.0) | 0.101 |
| Consider suicide past 12 months (yes) | 89 (55.6) | 61 (55.5) | 28 (56.0) | 0.949 |
| Attempt suicide past 12 months (ever) | 33 (20.6) | 25 (22.7) | 8 (16.0) | 0.330 |

TABLE 2. HEALTH-RELATED VARIABLES AMONG ALL PARTICIPANTS AND BY LINGUISTIC GROUP

Significant differences are given in bold.

Discussion

Taken together, our results show that although many TNB youth in Québec experience good physical health, a majority report mental health difficulties, with high levels of self-harm and suicidality. Higher levels of school and family connectedness were linked to lower odds of mental health challenges.

Our findings around mental health, self-harm, and suicidality may reflect the results of other studies comparing the experiences of TNB and cisgender youth,^{6,48–50} which show that despite some shifting norms toward TNB people,⁵¹ this group continues to be structurally disadvantaged, with clear mental health repercussions. Indeed, the rates of mental health challenges, self-harm, suicidal ideation, and suicide attempts among participants of this study are markedly higher than those in general youth populations.^{52–54}

School and family connectedness both emerged as related and potentially influential factors contributing to TNB youths' mental health. Our finding regarding school connectedness provides key insight, because apart from a small number of studies examining school belonging and safety as protective factors,^{23,24} the current literature on educational spaces and mental health among sexually diverse and TNB youth tends to focus on bullying, victimization, and other forms of abuse.^{49,55–58} However, it may be important to focus both on reducing these forms of abuse in schools and improving school connectedness. Fostering a greater sense

| TABLE 3. ASSOCIATIONS OF FAMILY AND | SCHOOL CONNECTEDNESS | WITH HEALTH OUTCOMES |
|-------------------------------------|----------------------|----------------------|
|-------------------------------------|----------------------|----------------------|

| Outcome | Predictor | aOR | р |
|---|----------------------|-------|-------|
| Self-rated physical health (good/very good/excellent vs. poor/fair) | | | |
| | Family connectedness | 1.448 | 0.104 |
| | School connectedness | 2.415 | 0.013 |
| Self-rated mental health (good/excellent vs. poor/fair) | | | |
| | Family connectedness | 2.620 | 0.001 |
| | School connectedness | 2.448 | 0.045 |
| Self-harm past 12 months (ever vs. never) | | | |
| | Family connectedness | 0.657 | 0.057 |
| | School connectedness | 1.325 | 0.418 |
| Considered suicide past 12 months (yes vs. no) | | | |
| 1 5 / | Family connectedness | 0.491 | 0.003 |
| | School connectedness | 0.782 | 0.466 |
| Attempted suicide past 12 months (ever vs. never) | | | |
| | Family connectedness | 0.425 | 0.002 |
| | School connectedness | 0.903 | 0.814 |

p-Values are given in bold when differences were significant at p < 0.05. Adjusted odds ratio results from the multivariate models including the predictor variable and age (dichotomous 14–18 years/19–25 years) and the outcome variable. Each predictor, controlling for age, was evaluated separately.

aOR, adjusted odds ratio.

of belonging thus constitutes a tangible avenue for training in addition to other recommendations that have been put forward on how to improve school settings for TNB youth.^{59,60}

Our finding about family support echoes much of the existing literature, suggesting that this sphere of TNB youths' lives is an equally important area for intervention. Further work would benefit from examining more specific aspects of family support and its effects on TNB youth's mental health. One example of this is a recent qualitative study with transgender youth, which found that certain types of support that may be more conducive to TNB youth feeling understood by and close to their parents and families, such as gender-identity–specific parental support, lagged behind other more general types of parental support.³⁴

Certain differences also emerged between the associations of school and family connectedness with health outcomes. First, school connectedness, but not family connectedness, was associated with physical health. This may be due to school being the main environment in which TNB youth spend their (waking) time, thus playing a key role in their physical health, either through the possibility of physical violence or through the physical embodiment of being in a protective or stressful environment. This is reflected in other studies. For example, one study examining health outcomes among cisgender, transgender, and nonbinary youth in Spain found that, whereas verbal attacks were more likely to happen to TNB youth both in and out of school, physical attacks were only significantly more likely in school.⁶¹

Conversely, school safety may be particularly protective of physical health, as another study reported that transgender students had healthier eating habits when they perceived their school environment as safe.⁶² Second, family connectedness, but not school connectedness was associated with reduced likelihood of suicidality and self-harm. This may be explained by the family playing a key role in providing respite from daily stressors, and the perceived permanence of family creating a sense of hopelessness when support is lacking. Indeed, although lack of parental support is consistently linked to suicidality,⁶³ key resilience factors such as hope (including hope of transitioning) and positive and self-defined identity,⁶⁴ may be fostered in the family in particular. Although outside the scope of this article, examining the links between positive self-defined identity measures (such as use of affirmed pronouns, living in felt gender, and legal name change), social support and health outcomes, may provide key insight into these mechanisms.

It is notable that the English-speaking group had both a higher proportion of nonbinary participants as well as significantly lower general mental health scores than the French-speaking group. As French is a highly gendered language in which gender-neutral pronouns are less widespread than in English, it is possible that French-speaking participants tended to identify in more binary terms. Nonbinary participants may experience challenges that distinguish them from binary transgender participants. For example, one study of TNB health care patients found that, although most participants had to educate their health care professional about gender, this was especially the case for nonbinary people.⁶⁵

Furthermore, gender nonconformity, even within sexually diverse communities, continues to be stigmatized.^{66,67} As such, nonbinary youth may experience certain difficulties that binary transgender youth do not, which may in turn correlate with their mental health.⁶⁸ However, this must be further explored as certain studies have also found the opposite, namely that nonbinary trans youth and adults have reported better mental health outcomes than their binary trans counterparts.^{69,70}

It is equally notable that the English-speaking group was composed of a higher proportion of BIPOC participants, considering these lower mental health scores. Indeed, the racism, colonialism, and xenophobia facing BIPOC youth has been found to compound the challenges facing TNB youth as a whole, leading to poorer mental health among BIPOC TNB youth.^{71–74} This may have impacted the differences in mental health scores between linguistic groups as well.

Limitations

Although these constitute meaningful findings as well as avenues for future research, our study contains certain limitations. For example, our sample size limited the power available to detect potentially clinically meaningful relationships. Furthermore, due to this limitation, we were unable to simultaneously and directly compare the impacts of family and school support on health outcomes in the same model to obtain the relative contribution of each source of support. In addition, the CTYHS did not include a validated measure of peer support, which would have been a relevant source of social support to capture and which could be studied in future studies. Finally, although the inclusion of two linguistic groups in our analysis was novel and informative, a larger sample size would have provided the opportunity to also stratify our logistic regression analyses by linguistic groups. Nonetheless, our results provide grounds to warrant further research on each of these questions.

Conclusion

Although TNB youth experience particularly high levels of mental health challenges, self-harm, and suicidality, different sources of support may help mitigate these. School and family connectedness are two protective sources of support that are amenable to targeted intervention. Language may also play a key role in the lived experiences of gender diverse youth when it comes to gender expression, mental health, and wellbeing. These results indicate that interventions should be put in place to foster safer and more supportive schools, and to help families be better equipped to support TNB youth.

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Authors' Contributions

K.L.-N.: Writing – original draft preparation. N.C.: Conceptualization, writing—review and editing, supervision. A.B.T.: Formal analysis, writing—review and editing. A.C.: Formal analysis, writing—review and editing. A.P.S.: Conceptualization, writing—review and editing. L.C.: Writing—review and editing. C.L.: Conceptualization. E.M.S.: Conceptualization, methodology, formal analysis, investigation, resources, writing—review and editing, supervision, project administration, funding acquisition.

Author Disclosure Statement

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Address correspondence to: Nicholas Chadi, MD, MPH Department of Pediatrics University of Montreal 3175 Ch de la Cote Ste-Catherine Montréal, QC H3T 1C5 Canada

E-mail: nicholas.chadi@umontreal.ca