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## Suicidality and non-suicidal self-injury among transgender populations: A systematic review

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### ABSTRACT

**Introduction:** Transgender individuals experience ongoing stigma, leading to a high mental health burden. This systematic review sought to identify risk and protective factors for suicidality and non-suicidal self-injury. **Method:** Three databases were searched and 52 articles selected. Risk and protective factors were categorized into discrimination, social support, comorbidities, medical transition status, and community and social policy factors. **Result:** Despite nearly all studies providing only cross-sectional or qualitative data, significant correlations were found between the categories of risk and protective factors and their respective outcomes. **Conclusion:** Future research should focus on prospective and longitudinal studies to further establish links of causality.

### ARTICLE HISTORY

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## Introduction

The term *transgender* (trans) refers to individuals who do not identify with the sex they were assigned at birth (e.g., a person who was assigned male at birth but identifies as a woman is a *transgender woman*). The term *gender expansive* refers to a wide range of gender identities that broaden gender-normative definitions and are neither male nor female (e.g., non-binary, gender-fluid, genderqueer), whereas the term *cisgender* refers to individuals who identify with the sex they were assigned at birth (e.g., a person who was assigned female at birth and identifies as a woman is a *cisgender woman*). The term *trans* will be used throughout this review to include transgender and gender expansive individuals.

Trans individuals across the world experience high levels of stigma, harassment, violence and discrimination, including exposure to gender identity conversion efforts (GICE) (Turban, et al., 2020a) and high rates

of homelessness due to identity-based rejection (Abramovich et al., 2020). Research has consistently reported that trans individuals in North America experience disproportionately higher rates of physical and mental health burden compared to the general population (Abramovich et al., 2020; Proctor et al., 2016).

The term *suicidal ideation* is used throughout this review to encompass all instances where an individual had thoughts of ending their life, whether this included having an active plan or not. The term *suicide attempt* is used to encompass all instances where an individual attempted to put an end to their life, irrespective of the lethality of the attempt or of hospitalization as a consequence of the attempt. The term *suicidality* will be used throughout to encompass both of these entities. A recent systematic review conducted on lifetime prevalence of suicidality among trans individuals, focused on articles published in the United States and Canada, found a lifetime average rate of 46% for suicidal ideation and 27% for suicidal attempts in the trans population (Adams & Vincent, 2019); rates which are three-fold and almost six-fold of the general population, respectively (Stickley et al., 2020). Trans youth experience even higher rates of suicidality compared to adults. In the United States, 34% of trans high school students reported experiencing suicidal ideation in the past year, nearly twice as many as cisgender youth (Perez-Brumer et al., 2017), and 61% over the course of their lifetime, a figure three times higher than in the cisgender youth population (Eisenberg et al., 2017). Thirty-one percent of trans youth have reported attempting suicide at least once in their lifetime, four times more than their cisgender counterparts (Eisenberg et al., 2017).

The term *non-suicidal self-injury (NSSI)* encompasses all instances where an individual intentionally hurts themselves (e.g., cutting, burning, bruising) without intent to end their life. Trans individuals experience higher rates of NSSI compared to the general population. For example, 22–31% of trans adults in the United States reported engaging in NSSI in the past year (Jackman et al., 2018; McDowell et al., 2019), and approximately 40% of trans youth reported NSSI (Taliaferro et al., 2018).

This systematic review is a synthesis of the research on risk and protective factors for suicidality and NSSI in the transgender population. The purpose of this review is to identify risk and protective factors that are consistently associated with suicidality and NSSI and the differences between trans youth and adults.

## Methods

An electronic literature search of the online databases MEDLINE, PSYCINFO, and Embase was conducted in January 2020 and included the

following keywords (see Appendix A for a complete list of search terms): *sexual and gender minorities, gender dysphoria, two-spirit, transgender, gender diverse, self-injurious behavior, self-harm, self-mutilation, suicide, and suicidal ideation*. This search yielded 3,280 articles. Two of the authors, MVP and NP, independently put the articles through an initial title and abstract screen, eliminating 2,611 references that did not meet inclusion criteria. These same authors then completed a full text screen, yielding 52 articles. Complete data extraction and quality assessment for each article were then completed by two researchers (MVP and HA).

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (see Appendix C for PRISMA checklist).

### ***Inclusion criteria***

Studies had to be published in peer-reviewed journals, focus on the LGBTQ2S+ population, and have explicitly mentioned examining the trans population. NSSI, suicidal ideation, or suicide attempts had to be explicitly mentioned as outcomes in order to be included. The outcome measures had to be prevalence and/or risk and/or protective factors associated with NSSI and/or suicidality. The articles had to have been published between 1990 and January 2020.

### ***Exclusion criteria***

All reviews (systematic reviews, scoping reviews, literature reviews, etc.) were excluded from this systematic review. Non-peer-reviewed reports, gray literature, guidelines and recommendations, editorials, letters to the editor, commentaries, theses, and dissertations were also excluded. No study was excluded because of quality appraisal.

### ***Characteristics of the studies***

#### ***Setting***

The majority (36) of the studies included were conducted in the United States, with a further four from the United Kingdom, three from Canada, two from China, one from Thailand, one from Sweden, one from Japan, one from Australia, and one from Argentina. Two were completed collaboratively by researchers in more than one country: one from the United States, Canada, and Ireland, and the other from the United States and Canada.

### **Age groups**

Most of the studies (31) focused on adult populations. The remaining 21 studies focused on youth (described as late adolescence to under the age of 25). None of the included studies targeted younger children or the geriatric population.

### **Outcomes**

Thirty-six studies reported exclusively on the outcome of suicidality, seven reported exclusively on the outcome of NSSI, and nine studies reported on a combination of both outcomes.

### **Quality assessment**

A quality assessment was completed for each article independently by two researchers (MVP and HA) using the Newcastle-Ottawa Quality Assessment Scale (Stang, 2010), adapted for cross-sectional studies. A third researcher (NP) reviewed the scores to come to a consensus when the two original researchers disagreed. The majority of included studies utilized survey methods to obtain cross-sectional data. None of the studies produced prospective data. Most of the studies utilized convenience sampling methods, such as snowball sampling and community outreach, with the exception of five studies that used data from a nationwide survey, eight studies that used data from province or statewide surveys, and four studies that used data from citywide surveys.

## **Results**

### **Suicidality**

#### **Adult**

**Medical transition status.** Both qualitative and quantitative studies (Table 1) reported a significant association between suicidal ideation and the desire to medically transition, but not having begun the transition process (Bailey et al., 2014; Chen et al., 2019; Rood et al., 2015). In contrast, the completion of the desired medical transition and accessing gender-affirming medical care were highlighted as protective factors for suicidal ideation in a number of studies (Bailey et al., 2014; Bauer et al., 2015; Tucker et al., 2018; Turban, et al., 2020b). Qualitative studies emphasized that their participants had explicitly stated that medically transitioning and the prospect of doing so in the future had decreased their suicidal ideation and were significant protective factors (Moody et al., 2015; Smith et al., 2018).

**Table 1.** Studies in this systematic review.

No.	Authors, year	Location	Age group	Sample size	NOS	Measure	Significant associations	Outcome measured
1	Barboza et al., 2016	United States	Adults	350	6	Risk factors, protective factors	Risk: Institutional discrimination, discriminatory physical attack Protective: Familial support, receiving counseling Social and medical transition	Lifetime suicidality
2	Bailey et al., 2014	United Kingdom	Adults	581	N/A	Prevalence, protective factors		Lifetime, past year, and current suicidality
3	Arcelus et al., 2016	United Kingdom	Youth	268	7	Prevalence, risk factors	Risk: Assigned male at birth vs. assigned female at birth, general psychopathology, levels of experienced transphobia, general interpersonal problems Protective: Gender-affirming hormone treatment	Lifetime and current NSSI
4	Allen et al., 2019	United States	Youth	47	8	Protective factors		Score on Ask-Suicide Screening Questionnaire Past-year suicidality
5	Bauer et al., 2015	Canada	Adults	380	6	Prevalence, protective factors, risk factors	Risk: Experienced transphobia Protective: Parental support, social support, gender-congruent ID, transition, hormone use	Lifetime suicidality
6	Trujillo et al., 2017	United States	Adults	78	6	Prevalence, risk factors	Risk: Harassment/rejection discrimination Risk: Sexual minority	Lifetime suicidality
7	Toomey et al., 2018	United States	Youth	120 transgender, 617 gender-expansive, 1052	6	Prevalence, risk factors		Lifetime suicidality
8	Tucker et al., 2018	United States	Adults	206	6	Protective factors	Protective: Gender-affirming hormone therapy, gender-affirming chest surgery, gender-affirming genital surgery	Past-year and past two weeks suicidality
9	Turban, et al., 2020a	United States	Adults	27 715	6	Prevalence, risk factors	Risk: Lifetime exposure to gender-identity conversion efforts (GICE), childhood exposure to GICE	Lifetime and past-year suicidality

(Continued)

**Table 1.** (Continued)

10	Turban, et al., 2020b	United States	Adults	27 715	6	Prevalence, risk factors	Risk: No access to pubertal suppression Risk: Minority gender identity	Lifetime suicidality
11	Thoma et al., 2019	United States	Youth	2020	6	Risk factors	Risk: Minority gender identity	Lifetime suicidality and NSSI
12	Strauss et al., 2020	Australia	Youth	859	5	Prevalence, risk factors	Risk: Housing access, body dysphoria, bullying, discrimination, employment issues, significant loss, isolation from services, helping others with mental health issues, lack of family support, peer rejection, issues in school	Lifetime suicidality and NSSI
13	Seelman et al., 2017	United States	Adults	417	4	Prevalence, risk factors	No significance achieved	Lifetime suicidality
14	Seelman et al., 2017	United States	Adults	2325	5	Prevalence, risk factors	Risk: Physical disability, mental disability, gender-appropriate bathrooms, gender-appropriate housing Protective: Chosen name use	Lifetime suicidality
15	Russell et al., 2018	United States	Youth	74	4	Prevalence, protective factors		Lifetime suicidality
16	Peterson et al., 2017	United States	Youth	96	4	Prevalence, risk factors	Risk: Drive for weight change	Lifetime suicidality and NSSI
17	Perez-Brumer et al., 2015	United States	Adults	1229	5	Prevalence, risk factors	Risk: Being non-White, college education, internalized transphobia Risk: Gender identity, depressive symptoms, victimization Risk: Microaggression frequency	Lifetime and past-year suicidality Past-year suicidality
18	Perez-Brumer et al., 2017	United States	Youth	280	7	Risk factors		Past-year suicidality
19	Parr & Howe, 2019	United States	Youth and adults	402 (182 identified as transgender)	4	Prevalence, risk factors	Risk: Microaggression frequency	Past-year and lifetime suicidality
20	Moody & Smith, 2013	Canada	Adults	133	6	Risk factors, protective factors	Protective: Social support from friends and family, optimism, reasons for living, suicide resilience	Suicidality

21	Moody et al., 2015	Canada	Adults	133	N/A	Qualitative	Social support, gender identity-related factors, transition-related factors, individual difference factors, reasons for living	Suicidality					
22	Mcdowell et al., 2019	United States	Adults	150	3	Prevalence, risk factors	Risk: Reduced access to housing, discrimination	Past-year NSSI					
23	Marshall et al., 2016	Argentina	Youth and adults	482	6	Prevalence, risk factors	Risk: Reduced access to housing, internalized stigma	Lifetime suicidality					
24	Kuper et al., 2018	United States	Youth and adults	1896	6	Prevalence, risk factors	No significance achieved	Past-year suicidality					
25	Klein & Golub, 2016	United States	Adults	5612	5	Prevalence, risk factors	Risk: non-White ethnicity/race, identifying as multiracial, education level, income, employment, family rejection	Lifetime suicidality					
26	Katz-Wise et al., 2018	United States	Youth	96 (33 transgender youth)	5	Prevalence, protective factors	Protective: Family satisfaction	Lifetime suicidality and NSSI					
27	Kattari et al., 2016	United States	Adults	417	4	Protective factors	Protective: Trans-inclusive healthcare provider	Past-year suicidality					
28	Jackman et al., 2018	United States	Adults	332	7	Prevalence, risk factors	Risk: Age, felt stigma	Lifetime and past-year NSSI					
29	Jackman et al., 2021	United States	Youth	497	6	Risk factors	Risk: Gender identity, feeling sad or hopeless	Past-year suicidality					
30	Hunt et al., 2020	United States, Canada, Ireland	Youth	90	N/A	Qualitative	Belongingness, thwarted self-preservation	Lifetime suicidality and NSSI					
31	Claes et al., 2015	United Kingdom	Adults	155	6	Prevalence, risk factors	Risk: Gender identity, age, interpersonal problems, psychological problems	Lifetime NSSI					
32	Grossman & D'augelli, 2007	United States	Youth	55	4	Risk factors	Risk: Childhood gender nonconformity, body esteem	Lifetime suicidality					
33	Gower et al., 2018	United States	Youth	2168	6	Risk factors, protective factors	Protective: Parent connectedness, support of adults in the community, school safety	Past-year suicidality					
34	Goldblum et al., 2012	United States	Adults	290	4	Prevalence, risk factors	Risk: Gender-based violence	Lifetime suicidality					
35	Eisenberg et al., 2019	United States	Youth	2168	6	Prevalence, Risk factors	Protective: Urban vs. rural residence	Past-year suicidality and NSSI					

(Continued)



Table 1. (Continued)

36	Davey et al., 2016	United Kingdom	Adults	97	5	Prevalence, risk factors	Risk: Gender identity, psychopathology, self-esteem, social support	Current NSSI
37	Clements-Nolle et al., 2006	United States	Adults	515	5	Prevalence, risk factors	Risk: Age, depression, substance use, sexual assault, discrimination	Lifetime suicidality
38	Testa et al., 2012	United States	Adults	271	4	Risk factors	Risk: Physical violence, sexual violence	Lifetime suicidality
39	Testa et al., 2017	United States, Canada	Adults	816	5	Risk factors	Risk: Rejection, non-affirmation, victimization, internalized transphobia, negative expectations	Current suicidality
40	Terada et al., 2011	Japan	Adults	500	4	Prevalence, risk factors	Risk: Education level	Lifetime suicidality and NSSI
41	Suen et al., 2018	Hong Kong	Youth and adults	106	5	Prevalence, risk factors	Risk: Income, gender identity, age	Lifetime suicidality
42	Smith et al., 2018	United States	Adults	30	N/A	Qualitative	Societal and community-level factors, interpersonal factors, impact of societal, community, and interpersonal factors on individual health and well-being	Lifetime suicidality
43	Edwards et al., 2020	United States	Adults	106	5	Risk factors	Risk: Perceived social support, emotional stability	Suicidality
44	Duffy et al., 2019	United States	Young adults	365 749 (678 transgender and gender-expansive)	8	Prevalence, risk factors	Risk: Eating disorders, gender identity	Past-year suicidality and NSSI
45	Dickey et al., 2015	United States	Adults	773	5	Prevalence, risk factors	Risk: Protection and feeling on the Body Investment Scale	Lifetime NSSI
46	Zeluf et al., 2018	Sweden	Youth and adults	796	5	Prevalence, risk factors, protective factors	Risk: Offensive treatment, trans-related violence Protective: Practical support	Past-year and lifetime suicidality
47	Yaegergard et al., 2014	Thailand	Youth	129	5	Risk factors	Risk: Family rejection, social isolation, loneliness	Current suicidality

48	Chen et al., 2019	China	Adults	1309	5	Prevalence, risk factors	Risk: Not identifying with assigned sex, seeking gender-affirming surgery, depression	Lifetime suicidality and NSSI
49	Rood et al., 2015	United States	Adults	350	5	Risk factors	Risk: Experienced sexual violence, experienced physical discrimination, planning to transition	Lifetime suicidality
50	Taliaferro et al., 2018	United States	Youth	2168	8	Prevalence, risk factors, protective factors	Risk: Depression, gender-based bullying, physical bullying Protective: parent connectedness	Lifetime and past-year NSSI
51	Ross-Reed et al., 2019	United States	Youth	451	7	Risk factors	Risk: Gender identity	Past-year suicidality and NSSI
52	Taliaferro et al., 2019	United States	Youth	1635	4	Risk factors	Risk: Mental health problems, depression, running away, substance use, abuse, relationship violence, bullying victimization, parent connectedness, lower grades, school safety	Lifetime suicidality and NSSI

**Comorbidities.** A diagnosis of major depressive disorder and/or having previously engaged in NSSI indicated significant risk factors for suicidal ideation (Chen et al., 2019; Clements-Nolle et al., 2006). These studies pointed to how mental illness could increase the already elevated rate of suicidality among trans individuals, also marking the association between a major depressive disorder diagnosis and significantly increased odds of experiencing a suicide attempt (Chen et al., 2019). Other mental health disorders highlighted included treated substance use disorders, which Clements-Nolle et al. (2006) found were associated with twice the odds of experiencing a lifetime suicide attempt. The importance of these risk factors was pointed out by Barboza et al. (2016), who found that receiving counseling for mental illness was associated with significantly lower levels of lifetime suicidal ideation, as well as a study by Smith et al. (2018), which found that barriers to accessing mental health services led to a negative impact on their participants' well-being.

**Discrimination.** Increased suicidal ideation was found to be associated with gender-related discrimination, as were suicide attempts (Bauer et al., 2015; Clements-Nolle et al., 2006; Zeluf et al., 2018). While discrimination could manifest as “offensive treatment” (Zeluf et al., 2018), rejection, non-affirmation, and victimization (Testa et al., 2017), or harassment (Trujillo et al., 2017), it could also manifest as outright physical or sexual violence (Barboza et al., 2016; Chen et al., 2019; Goldblum et al., 2012; Rood et al., 2015; Testa et al., 2017; Zeluf et al., 2018). Experienced gender-based violence was associated with both increased suicidal ideation and suicide attempts in the trans population worldwide (Barboza et al., 2016; Chen et al., 2019; Goldblum et al., 2012; Rood et al., 2015; Testa et al., 2017; Zeluf et al., 2018). The most specific of these forms of discrimination were gender identity conversion efforts (GICE or conversion therapy), exposure to which was found to be associated with increased suicidal ideation and suicide attempts, especially among those who had experienced it before the age of 10 (Turban, et al., 2020a). Although the above forms of transphobia were external, internalized transphobia was also found to be associated with both increased suicidal ideation (Testa et al., 2017) and suicide attempts (Marshall et al., 2016; Perez-Brumer et al., 2015).

**Social support.** The importance of social support as a protective factor for suicidality was reported by several qualitative and quantitative studies (Barboza et al., 2016; Bauer et al., 2015; Hunt et al., 2020; Moody & Smith, 2013; Moody et al., 2015; Smith et al., 2018). In contrast to these findings, high rates of family rejection (Klein & Golub, 2016) and not being able to access practical support (described as someone to call for help with

everyday things) (Zeluf et al., 2018) were associated with increased suicide attempts. Several studies reported that family was the most important form of social support (Barboza et al., 2016; Bauer et al., 2015; Klein & Golub, 2016).

*Community and social policy factors.* Smith et al. (2018) underscored the differences between urban and rural environments, reporting that their study participants linked the rural environment to conservative community attitudes and increased discrimination, which in turn led to them feeling unsafe. The same study found that social policies, such as nondiscrimination ordinances, would have contributed to making their participants feel safer (Smith et al., 2018). Similarly, Seelman (2016) found that being denied access to gender-appropriate bathrooms or housing was associated with increased suicide attempts. Other than rural vs. urban environments, social factors associated with increased suicide attempts included non-White race/ethnicity, identifying as multiracial, lower level of education and income, and being unemployed (Klein & Golub, 2016). In contrast, identifying as White (Perez-Brumer et al., 2015), higher level of education (Perez-Brumer et al., 2015), having one or more pieces of gender-congruent identification (Bauer et al., 2015), and access to stable housing (Marshall et al., 2016) were found to be protective factors for suicidality. Non-White trans individuals are at higher risk of suicide due to stigma and racism. For example, living in more stigmatizing communities facilitates vulnerability to stigma-related stressors, leading to increased suicidality (Perez-Brumer et al., 2015).

### *Youth (under 25)*

*Medical transition status.* The only study with prospective data in this review found a significant association between accessing gender-affirming care and significantly lower scores on the Ask-Suicide Screen Questionnaire, three months after starting gender-affirming hormone treatment (Allen et al., 2019). Accessing gender-affirming care was also associated with reduced suicidality, similar to the trans adult population. Allen et al. (2019) found that those who received puberty suppression and gender-affirming hormones scored 0 on the questionnaire three months into the treatment, indicating no suicidality at all.

*Comorbidities.* Among trans youth, depressive symptoms, rather than a diagnosis of major depressive disorder, were associated with increased suicidal ideation and suicide attempts, based on a state-wide and nationwide survey (Jackman et al., 2021; Perez-Brumer et al., 2017). Studies in Australia and the United States reported that body dysphoria, body esteem, and level

of satisfaction with weight and appearance were factors associated with increased suicidal ideation (Grossman & D'augelli, 2007; Strauss et al., 2020). Body image issues resulting from weight-related mental health pathologies were also found to increase the likelihood of experiencing a suicide attempt (Duffy et al., 2019; Peterson et al., 2017).

***Discrimination.*** In both Australia and the United States, gender-related bullying, victimization, and rejection by their peers were associated with increased suicidal ideation and suicide attempts in trans youth (Perez-Brumer et al., 2017; Strauss et al., 2020). Similarly, Parr and Howe (2019) found an association between increased suicidal ideation and frequent microaggressions by peers. Conversely, feeling safe at school was identified as a protective factor for suicidality, based on data from a state-wide survey (Gower et al., 2018). Unlike studies conducted among the trans adult population, studies among the youth population focused on school-based factors, rather than societal discrimination and violence.

***Social support.*** Trans youth identified family support (Strauss et al., 2020), specifically parental support (Gower et al., 2018), as the most important source of support in their lives, described as a protective factor for suicidality. Chosen name use by their support network was also associated with a significant reduction in suicidal ideation (Russell et al., 2018).

***Community and social policy factors.*** Strauss et al. (2020) used a nationwide survey to identify socioeconomic factors associated with increased suicidality, including accommodation issues, employment issues, school issues, and feeling isolated from services. No further details about these factors were available.

## ***Non-suicidal self-injury***

### ***Adult***

***Comorbidities.*** Gender dysphoria and body dissatisfaction (including the diagnosis of an eating disorder) were found to increase the odds of engaging in NSSI (Davey et al., 2016; Dickey et al., 2015), as well as lower levels of self-esteem (Davey et al., 2016). A formal diagnosis of mental illness was also found to be significantly associated with engagement in NSSI (Davey et al., 2016).

**Discrimination.** Discrimination was not highlighted by many studies in the adult population. One relatively small study among trans-masculine individuals in the Boston area found that discrimination was associated with a small increase in the odds of engaging in NSSI (Mcdowell et al., 2019). The same study reported that unstable housing was associated with increased odds of engagement in NSSI (Mcdowell et al., 2019). A study conducted in three major American metropolitan areas found that felt stigma was also associated with increased odds of engagement in NSSI (Jackman et al., 2018).

### **Youth**

**Comorbidities.** Formally diagnosed psychopathologies were highlighted as important risk factors for engaging in NSSI by several studies, specifically major depressive disorder (Taliaferro et al., 2018), eating disorders (Duffy et al., 2019), and general psychopathologies (Arcelus et al., 2016).

**Discrimination.** Discrimination was explored more in depth in the youth population, with studies focusing on peer rejection and bullying (Strauss et al., 2020), and physical bullying and gender-based bullying (Taliaferro et al., 2018), all of which were found to be associated with higher odds of engagement in NSSI. Strauss et al. (2020) also found that exposure to gender-based discrimination, not just in the context of school, was associated with increased odds of engagement in NSSI.

**Social support.** In contrast with victimization, support, specifically familial support, was found to be an important protective factor against engagement in NSSI (Katz-Wise et al., 2018; Taliaferro et al., 2018). Parental connectedness was found to be particularly important by Taliaferro et al. (2018). In keeping with these studies, Strauss et al. (2020) found that lack of family support was associated with increased odds of engagement in NSSI.

**Community and social policy factors.** Strauss et al. (2020) also identified socioeconomic factors associated with increased odds of engaging in NSSI: employment issues, school issues, and feeling isolated from services. The urban vs. rural environment dichotomy also came into play with Minnesota trans youth, as shown by Eisenberg et al. (2019), who found that rural trans youth had significantly higher odds of engaging in NSSI than their urban counterparts.

## Discussion

### *State of the literature*

This systematic review identified several important gaps in the literature.

The first identified gap was a major lack of trans-related research conducted globally and a lack of cultural diversity among the articles included. The majority of studies were conducted in White, English-speaking countries, with just four studies from Asia and one from South America. Most of the data came from the United States, Canada, the United Kingdom, Australia, and Sweden. There were no studies from countries in the rest of the Americas, Europe, or Africa represented. There were also only two articles focusing on trans individuals in rural settings and they did highlight that there were significant differences with regards to mental health and quality of life for trans individuals living in rural settings; this would also require further investigation. Trans individuals reside all over the world and obtaining data that is reflective of this must be a goal for future researchers.

The second gap was a lack of studies investigating prevalence, risk, and protective factors among older trans adults and younger trans children. The groups represented in this review included trans adults and youth (from mid-adolescence to the age of 25). Future efforts should be made to improve identification of these older adults and younger children.

The final major gap in the literature was a dearth of prospective and longitudinal data. Only one study (Allen et al., 2019) offered prospective data by examining the study population prior to beginning gender-affirming hormone treatment and again three months later. The other studies, despite including large and representative sample sizes, offered cross-sectional or qualitative data, making inferences of causality impossible in most cases. While most studies found significant correlations between their risk and protective factors and the outcomes of either suicidality or NSSI, no temporality can be established, and their correlations cannot be extrapolated into causations.

It is important to note that while sex designation is often collected as part of administrative health data, gender identity is not. Collecting data on gender identity in federal surveys and hospital databases would make it possible to link claims data to gender identity and provide a more accurate understanding of the physical and mental health outcomes among trans individuals.

### *Outcomes and implications*

The prevalence of both outcomes—namely, suicidality and NSSI—was disproportionately high among trans individuals. While many risk and protective factors were identified and categorized (discrimination, transition

status, social support, comorbidities, community-related factors, and social policy), exposure to discrimination in its various forms was the one that was consistently associated with these outcomes across nearly all studies. Whether that was discrimination as gender-based violence, bullying, or microaggressions, it had a significant correlation with suicidality and engagement in NSSI. As explained earlier, discrimination against trans individuals is not merely ingrained in society's attitude toward this population, but is present in its laws, including in the United States: 18 states and three territories still have negative policies toward trans individuals, and no protections in place for them (Movement Advancement Project, 2020). Social support had strong correlations as a protective factor, especially with regards to support from family and friends; however, despite most respondents stating they had strong social support, the Montana qualitative study emphasized that trans individuals still did not feel safe in rural Montana without any legal protections from the government, as they felt their more conservative surroundings were unwelcoming and unsupportive (Smith et al., 2018).

It is also important to note that while some participants had more internal risk factors with regards to their transition status, such as denial or confusion about their gender identity, most of the identified issues focused on access to gender-affirming care and how they would be viewed by society if they disclosed their true gender identity (Bailey et al., 2014). Conversely, access to hormones and/or gender-confirming surgery by those who desired to medically transition was consistently identified as a protective factor (Bailey et al., 2014; Bauer et al., 2015; Smith et al., 2018; Tucker et al., 2018; Turban, et al., 2020b).

Accessibility's importance was not limited to gender-affirming care, but to care for comorbidities, as well. Counseling was significantly associated with reductions in negative outcomes (Barboza et al., 2016) and having a trans-inclusive healthcare provider was, as well (Kattari et al., 2016).

Trans individuals associate improved mental health with feeling safe in their communities and accessing appropriate healthcare. To feel safe in their communities, they require social support from meaningful others in their lives, but this review has shown the onus is largely on their governments to institute nondiscrimination ordinances with regards to their right to live and work as their felt gender, as well as implement social policies to promote improved access to gender-affirming healthcare. At a structural level, this would mean instituting policies that reduce the stigmatization felt by this population and protect them from discrimination; at a community level, this would mean increasing available supports and access to housing and bathrooms for trans individuals; and at an individual level, this would mean improving access to care such as psychotherapy to reduce their felt psychological distress and minority stress. Healthcare providers in all



settings, including the emergency department, require increased education with regard to this population to provide care safely and without increasing the stigma already felt by their patients. Education is also important in the general population, to reduce the stigma felt by trans individuals in their everyday lives and increase the size of their available support network.

### **Limitations**

This review was not without its limitations. The included studies varied in sample size and selection strategy, often making it difficult to compare them. However, as a systematic review, we wanted to be as comprehensive as possible and felt it was therefore important to include as many studies as possible. Despite this we did not include studies from the gray literature and did not include studies that were not in English. As explained earlier, other than the qualitative studies and the one prospective study, all the data are cross-sectional, making any inferences of causality impossible, and also as previously noted, the generalizability of this review may be affected by the geographical distribution of the articles (mostly in majority White, English-speaking countries). Many studies did not differentiate between transgender and gender expansive individuals, and two studies included cross-dressers in their investigation, as well. Nearly all the samples were convenience samples, implying sampling biases for most included studies. Another important bias to note is survival bias, as only the survivors of suicide attempts can report past suicide attempts in cross-sectional studies.

### **Conclusion**

The articles included in this systematic review identified many risk and protective factors for suicidal ideation, suicide attempts, and NSSI in the trans population. They also described the prevalence of these outcomes in this population. Future research will be required to describe this in more detail, namely by diversifying the different cultural populations investigated, diversifying the age groups investigated, and differentiating between different gender identities. It will also be important to accumulate more prospective and longitudinal data to better understand causality with regards to the identified risk and protective factors. Another future step will be to investigate emergency department use and hospitalizations by this population, to better understand their disproportionate comorbidity burden.

### **Conflict of interest**

The authors have no conflict of interest to declare. The authors have no financial declaration to make.

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## Appendices

### Appendix A: Complete list of search terms

1. exp "Sexual and Gender Minorities"/(5359)
2. (sex\* adj3 minorit\*).mp. (5184)
3. (gender adj3 minorit\*).mp. (3456)
4. exp Gender Identity/(19235)
5. gender identi\*.mp. (20081)
6. exp Gender Dysphoria/(409)
7. gender dysphoria.mp. (1132)
8. glbt.mp. (95)
9. glbtq.mp. (14)
10. lbg.mp. (299)
11. lgbt.mp. (1416)
12. lgbtq.mp. (655)
13. lesbigay.mp. (5)
14. non-heterosexual\*.mp. (238)
15. exp Bisexuality/(4004)
16. bisexual\*.mp. (10005)
17. exp Homosexuality/(28950)
18. homosexual\*.mp. (34395)
19. queer.mp. (1221)
20. questioning.mp. (9482)
21. two spirit\*.mp. (60)
22. gay.mp. (10850)
23. lesbian\*.mp. (6557)
24. women who have sex with women.mp. (171)
25. men who have sex with men.mp. (10988)
26. exp Transgender Persons/(2736)
27. transgender.mp. (6052)
28. tran?.mp. (170317)
29. gender diverse.mp. (187)
30. gender variant.mp. (78)
31. genderqueer.mp. (58)
32. intersex.mp. (1672)
33. transsex\*.mp. (4261)
34. asexual\*.mp. (9397)
35. or/1-34 [LGBTQ2S+] (257900)
36. exp Self-Injurious Behavior/(68908)
37. self-injur\*.mp. (9786)
38. self harm\*.mp. (5675)
39. self destruct\*.mp. (1890)
40. exp Self Mutilation/(3193)
41. self mutilat\*.mp. (3953)
42. automutilation.mp. (97)
43. exp Suicide/(61280)
44. exp Suicide, Attempted/(19391)
45. suicid\*.mp. (92267)

46. exp Suicidal Ideation/(6436)
47. suicid\* ideation\*.mp. (13233)
48. SITB.mp. [suicidal thoughts and behaviors] (30)
49. NSSI.mp. [non-suicidal self-injury] (973)
50. or/36-49 [self harm, suicide risk] (103028)
51. exp Hospitalization/(231671)
52. hospitaliz\*.mp. (274161)
53. hospitalis\*.mp. (30280)
54. exp Institutionalization/(8443)
55. institutionaliz\*.mp. (17674)
56. exp Emergencies/(39803)
57. emergenc\*.mp. (422541)
58. exp Emergency Service, Hospital/(75109)
59. exp Emergency Services, Psychiatric/(2418)
60. (emergenc\* adj3 psychiatric).mp. (3895)
61. exp Emergency Treatment/(116874)
62. emergency treatment\*.mp. (14294)
63. emergency therap\*.mp. (479)
64. exp Mental Health Services/(93635)
65. mental hygiene service\*.mp. (104)
66. mental health service\*.mp. (59811)
67. exp Crisis Intervention/(5605)
68. (crisis adj3 interven\*).mp. (6384)
69. (crisis adj3 services).mp. (409)
70. exp Community Mental Health Centers/(3198)
71. exp Community Mental Health Services/(18357)
72. (community adj3 Mental\* adj3 Health).mp. (24757)
73. (mental health adj3 (servic\* or program or programme)).mp. (62245)
74. ((mental health or psychiatric) adj3 treatment\*).mp. (15524)
75. or/51-74 [emergency] (997815)
76. 35 and 50 and 75 [LGBTQ2S+ |self harm, suicide risk | emergency] (228)
77. exp "Continuity of Patient Care"/(237570)
78. (contin\* adj3 care).mp. (35604)
79. (continuum adj3 care).mp. (4387)
80. ("patient care " adj3 continuity).mp. (19047)
81. exp Aftercare/(187270)
82. aftercar\*.mp. (10851)
83. after car\*.mp. (37773)
84. after treatment\*.mp. (167383)
85. (follow-up or following up).mp. (1290432)
86. or/77-85 [after care] (1682398)
87. 75 or 86 [Emergency OR After Care] (2525808)
88. 35 and 50 and 75 and 86 [LGBTQ2S+ | self harm, suicide | emergency AND aftercare] (14)
89. 35 and 50 and 87 [LGBTQ2S+ | self harm, suicide | emergency OR aftercare] (309)
90. 35 and 50 [LGBTQ2S+ | self harm, suicide]
91. limit 90 to year="1990-2020"
92. limit 89 to year="1990-2020"
93. limit 88 to year="1990-2020"



## Appendix B: Newcastle-Ottawa Quality Assessment Scale (adapted for cross-sectional studies)

Each star (\*) represents 1 point (e.g., \*= 1 point; \*\* = 2 points, etc.)

This assessment is to be done for each article

### Selection (Maximum 5):

- Representativeness of the sample:
  - Truly representative of the average in the target population (all subjects or random sampling)\*
  - Somewhat representative of the average in the target group(non-random sampling)\*
  - Selected group of users/convenience sample
  - No description of the sampling strategy
- Sample size:
  - Justified and satisfactory (including sample size calculation)\*
  - Not justified
  - No information provided
- Non-respondents:
  - Proportion of target sample recruited attains pre-specified target or basic summary of non-respondent characteristics in sampling frame recorded\*
  - Unsatisfactory recruitment rate, no summary data on non-respondents
  - No information provided
- Ascertainment of the exposure (risk factor):
  - Validated measurement tool\*\*
  - Non-validated measurement tool, but the tool is described\*No description of the measurement tool

### Comparability (Maximum 2 stars):

- Comparability of subjects in different outcome groups on the basis of design or analysis.
  - Confounding factors controlled.
  - Study control for age and gender (or analysis separated by gender)\*
  - Study controls for any additional factor\*

### Outcome (Maximum 3):

- Assessment of outcome (self-harm or suicidality):
  - Independent blind assessment\*\*
  - Clinical record\*\*
  - Self-report\*
  - No description
- Statistical test:
  - Statistical test used to analyze the data clearly described, appropriate and measures of association presented including confidence intervals and probability level (p value)\*
  - Statistical test not appropriate, not described or incomplete

### Total Number of Points:

Cross-sectional Studies:

Very Good Studies: 9-10 points

Good Studies: 7-8 points

Satisfactory Studies: 5-6 points

Unsatisfactory Studies: 0 to 4 points

This scale has been adapted from the Newcastle-Ottawa Quality Assessment Scale for cohort studies to provide quality assessment of cross sectional studies. (The images below have been adapted from PRISMA (<http://www.prisma-statement.org/PRISMAStatement/PRISMAStatement.aspx>), which was originally released under a Creative Commons Attribution license.)

## Appendix C: PRISMA 2009 checklist



### PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
<b>TITLE</b>			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria; participants; and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	1
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known.	1
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	2
<b>METHODS</b>			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	N/A
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	2
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	2
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	21
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	2-3
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	2
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	2
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	3
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	N/A
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., $I^2$ for each meta-analysis).	N/A



### PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	14
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
<b>RESULTS</b>			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	4
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	4-9
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	4-9
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study, (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	4-9
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see item 15).	4-9
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see item 16]).	N/A
<b>DISCUSSION</b>			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	12
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	14
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	13
<b>FUNDING</b>			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	15