



# Factors that drive mental health disparities and promote well-being in transgender and nonbinary people

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**Abstract** | Transgender (or trans) is an umbrella term for individuals who experience their gender differently from what is associated with the sex they were assigned at birth. Individuals who are nonbinary experience their gender outside binary conceptions of gender. Although research has predominantly focused on negative mental health outcomes for transgender and non-binary (TNB) individuals, an emergent literature has begun to explore protective and health-promoting factors and dimensions of psychological well-being. In this Review, we discuss the sociocultural context for TNB people, beginning with a brief history of TNB identity before highlighting frameworks for understanding the higher prevalence of certain mental health concerns among TNB individuals. Next, we summarize the predictive factors associated with higher rates of depression, anxiety, suicidality, trauma-related concerns, disordered eating behaviours and substance use. We also review TNB coping, resilience and resistance to anti-trans stigma, as well as psychological well-being, flourishing and gender euphoria. Tying these topics together, we discuss affirming interventions for reducing mental health disparities and promoting psychological health in TNB individuals and communities. We conclude by discussing future research directions.

## Cisnormativity

The notion that cisgender identities are the norm and that variation from the gender binary is abnormal.

In many cultures, particularly those with a history of European colonization<sup>1</sup>, gender is considered to consist of two mutually exclusive categories of male or man and female or woman<sup>2</sup>, also referred to as the gender binary. Cisgender is a term used for individuals whose gender is aligned with what is culturally typically expected for their perceived sex<sup>3</sup>. Core to gender binary beliefs are essentialist assumptions that one's gender identity is determined by the sex assigned at birth<sup>4</sup> and is static across one's lifespan<sup>5</sup> — beliefs that are further grounded in cisnormativity<sup>6</sup>.

However, not all individuals have sex and gender experiences that align with the gender binary and these individuals have existed throughout history and across cultures<sup>5,7</sup>. In recent decades, 'trans' (short for transgender) has emerged as an umbrella term for individuals whose experience of their gender differs from the sex they were assigned at birth<sup>2</sup>. For some trans individuals, their gender experience — including an internal sense of gender (gender identity) and outward expressions of gender through clothing, mannerisms and other means (gender expression) — is of a man or woman, whereas for others it might be neither, a blend or a different gender altogether<sup>2</sup>. Nonbinary is a related umbrella term for gender experiences that do not align neatly with

binary gender terms. The related term 'two spirit' is used by some Indigenous and Native communities to span a range of gender diversity, expression and identities, related to concepts of transness<sup>8</sup>. Individuals have varying relationships to the terms trans and nonbinary. For example, not all nonbinary individuals also identify as trans, not all trans men and trans women identify as binary, and not all individuals who identify as cisgender identify their gender as aligning in all ways with the sex assigned to them at birth.

Health surveillance studies that use inclusive measures to identify TNB respondents remain limited, so although some evidence shows increasing proportions of TNB respondents<sup>9</sup>, there are no clear global population counts of TNB people. Even in contexts in which TNB people feel free to report their identity, numerous issues related to measurement and reporting hamper efforts to determine accurate estimates of people who identify as TNB, such as a lack of consistency in questions about gender<sup>10</sup>. Scholars have called for a two-step method to assessing gender identity<sup>9,11,12</sup>, in which all participants are asked about sex assigned to them at birth as well as their current gender identity, but this approach has been inconsistently implemented<sup>10</sup>. Where data do exist, conservative estimates suggest that 0.1% to

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0.5% of the population globally might be transgender, or approximately 7.8 to 38.8 million people as of 2022<sup>13–15</sup>.

In the USA, TNB adults are on average younger, more diverse in race and ethnicity and more likely to live in urban areas, and report lower incomes and greater financial struggles, in comparison to their cisgender peers<sup>16–19</sup>. According to data collected by the United States Centers for Disease Control and Prevention, the number of transgender adults in the USA doubled between 2004 and 2014, with an estimated proportion of 0.6%, or 1.4 million adults in the USA identifying as transgender<sup>17</sup>. This apparent growth is probably attributable to better data collection methods and the greater visibility of TNB people.

Data collected through probability sampling in the USA reveals notable within-group demographic variability<sup>20</sup>. A greater proportion of trans women identified as white compared to trans men and nonbinary respondents. Among Black respondents, a greater proportion identified as trans men compared to trans women or nonbinary. Among Latinx respondents, the largest proportion identified as nonbinary, followed by trans men, then trans women. Finally, among multiracial respondents, trans women and nonbinary respondents represented a larger proportion of respondents than trans men. Although data do not exist at this time to explain empirically why differences in gender occur across racial subgroups, these findings emphasize that within-population differences should be considered and investigated in TNB health research.

TNB people face a host of barriers to optimal health and well-being. They experience high rates of prejudice and discrimination, ranging from interpersonal exchanges to experiences within broader societal institutions and systems. However, TNB people also use effective strategies to mitigate the harm associated with marginalization, engage in constructing and strengthening community relationships, find meaning and purpose in their daily lives, and live fully authentic lives<sup>21,22</sup>.

In this Review, we summarize the literature on TNB mental health and well-being, highlighting variability at the intersections of gender and race and ethnicity. We draw on contemporary theories to explain the links between sociocultural factors and adverse mental health concerns in TNB populations. We describe mental health disparities, including high rates of depression, anxiety, suicidality, substance use and disordered eating, noting within-group differences where data are available. We also summarize the literature related to resilience, resistance, and coping with anti-trans stigma, and the factors that promote positive psychological well-being. We outline affirming interventions, including gender-affirming medical interventions and mental health interventions aimed at addressing TNB mental health concerns and promoting well-being. Finally, we discuss future research directions for theoretical and empirical work.

Although they are far from comprehensive, the broad terms trans and nonbinary are the ones usually used in scholarly journals that publish in English. However, gender-related language and terminology continue to evolve within TNB communities<sup>23</sup>. We encourage readers who want to learn about current language and terms

to regularly search the scholarly literature (such as REF.<sup>23</sup>) and to review recent discussions in public TNB social media groups.

### Changing conceptions of trans identity

To frame mental health disparities within TNB populations, it is critical to understand how conceptualizations of TNB identity and health have shifted over time. Mental health and TNB identity have been inextricably linked in white Western cultures since the middle of the twentieth century. The formal diagnosis of ‘transsexualism’ under ‘Gender Identity Disorders’ appeared in the third edition of the Diagnostic and Statistical Manual of Mental Health Disorders (DSM-III), published by the American Psychiatric Association in 1980<sup>24,25</sup>. Close collaboration of the American Psychiatric Association with the World Health Organization has created close alignment of criteria for diagnosing mental health conditions worldwide. The diagnostic label has changed over time, from ‘transsexualism’ (DSM-III) to ‘gender identity disorder’ (DSM-IV) to ‘gender dysphoria’ (DSM-5) with the aim of decreasing the stigma associated with the label. However, many of the same criteria — such as clinically significant distress within one’s assigned sex and a desire to change primary or secondary sex characteristics — have remained. Beyond its use as a diagnosis<sup>26</sup>, ‘gender dysphoria’ also refers more broadly to a sense of dissonance felt between one’s assigned gender and/or body and personal sense of self<sup>3</sup> that can vary in intensity of distress.

Concurrent with the publication of the DSM-III in 1980 and incorporating the same assessment criteria for gender dysphoria, the first formal guidelines for the medical treatment of transgender persons were published in 1979. These initial standards of care provided formal avenues by which transgender individuals could access necessary and life-changing medical treatments, such as hormones and gender-affirming surgeries, which are often associated with medical transition, a central aspect of gender-affirming health-care. The 1979 standards of care adopted a medical model, describing trans identity as a pathology to be evaluated and diagnosed. Mental health professionals were positioned as gatekeepers whose responsibility was to clinically evaluate the degree to which trans patients met the diagnostic criteria of gender dysphoria and could be deemed acceptable candidates for medical transition. Additional stipulations needed to be met in order to demonstrate social ‘readiness’ for medical intervention, such as time enrolled in psychotherapy prior to hormones or surgery and living ‘full time’ in one’s gender across all contexts of an individual’s life<sup>6</sup>. In addition to considerable barriers to accessing psychotherapy services — such as high cost and few providers with experience working with trans individuals — the requirement to live ‘full time’ prior to medical transition can imperil an individual’s job and relationships, creating further barriers to obtaining the necessary medical and social support. Common practice required one or more letters of support written by a licensed mental health professional prior to scheduling gender-affirming surgeries (a practice that persists to this day by medical providers worldwide who follow

#### Gender-affirming health-care

Healthcare that holistically attends to TNB individuals’ physical, mental and social health and well-being in ways that are explicitly respectful and affirming of their gender.

**Cisgenderism**

The prejudice that accompanies cisnormativity.

**Misgendering**

Addressing a TNB individual using a name or pronouns that are incongruent with the gender with which that individual identifies.

**Transphobia**

An aversion or hostility to, disdain for, or other negative attitudes and beliefs about transgender people.

the standards of care outlined by the World Professional Association for Transgender Health).

Contemporary conceptualizations of what it means to be trans have moved away from a medical model and towards self-determined identity<sup>13</sup>. An identity model conceptualization — what we use in this Review — acknowledges the experience of gender dysphoria that some, but not all TNB people have. Rather than focusing on this experience, identity models consider gender to fall on a spectrum of normal variation, unconstrained by binary conceptions. This model recognizes that not all TNB individuals desire medical interventions. Thus, gender dysphoria is an aspect of mental health — albeit one that is population-specific — rather than a defining characteristic of what it means to be trans. In this context, we discuss frameworks for understanding mental health disparities and protective factors relevant to a broad spectrum of TNB experiences.

**Sociocultural theories and context**

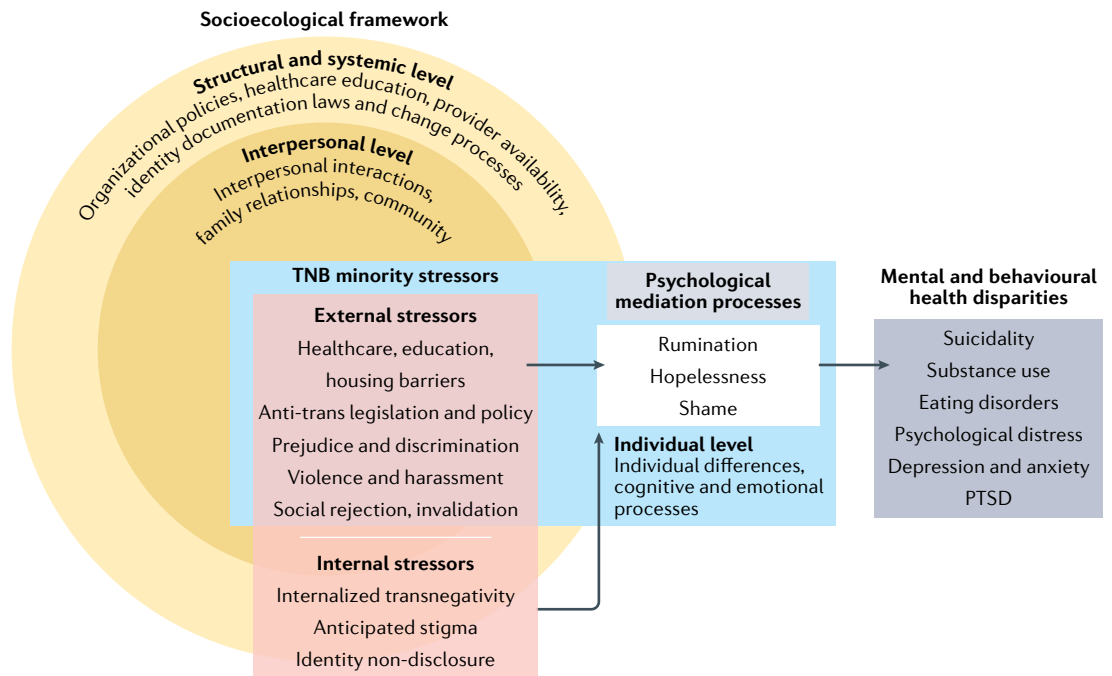
The first theoretical framework used to explain the higher rates of mental health concerns among TNB people was minority-stress theory<sup>27–29</sup>. This theory holds that individuals whose identities are stigmatized in society experience disproportionately high stress resulting from societal stigma<sup>27–29</sup>. Minority-stress theory conceptualizes stigma-related stressors as occurring externally to the self (such as discrimination and harassment) as well as internally within the self (such as internalizing negative attitudes, anticipating stigma experiences or monitoring oneself to avoid accidental identity disclosure). Although internal stressors have been positioned as mediators between external stressors and adverse mental health outcomes<sup>30</sup>, evidence for such mediation is mixed. More frequently, internal stressors either occur concomitantly with external stressors<sup>31,32</sup> or partially but do not fully mediate the relationship of external stressors with adverse health outcomes<sup>33,34</sup>. Stressors drive mental health concerns among stigmatized populations such as sexual-minority populations (individuals who identify as queer, lesbian or gay, bisexual, pansexual and other identities)<sup>27–29</sup> and individuals with disabilities<sup>35,36</sup>. This framework has largely been supported in data collected across the USA, the Netherlands and Australia. There are robust links between stigma-related stressors (such as internalized negative attitudes, perceived stigma, and identity-related physical abuse and harassment) and adverse mental health outcomes (including psychological distress, suicidality and substance use) for sexual-minority youths and adults<sup>29,37–39</sup>.

The key tenets of minority-stress theory have found empirical support in research with TNB populations<sup>37,40–42</sup>. Minority stress in TNB populations is embedded within cisnormativity in society<sup>43,44</sup>. For TNB individuals, cisnormative structures intersect with the prejudice of cisgenderism to create a host of stressors<sup>45</sup>. Similarly to those experienced by sexual-minority populations, examples of external stressors include bias and discrimination experiences, experiencing physical, verbal, sexual and emotional harassment and violence, rejection by one's family, friends and larger community, and other forms of rejection of trans identity, such as

misgendering<sup>30</sup>. For example, when the only available public restrooms are gendered for men or women, a TNB person might be criticized by a cisgender person for using the 'wrong' restroom. Examples of internal stressors discussed within the minority-stress literature include gender dysphoria, anticipation or expectation of experiencing stigma, stress associated with identity disclosure or concealment, and internalized transphobia or transnegativity (the internalization of cisgenderism)<sup>30,31,46</sup>.

Whereas minority-stress theory is specifically concerned with gender- and sexuality-based stigma, another sociocultural framework that is critical to understanding the experiences of TNB people is intersectionality theory<sup>47</sup>. Intersectionality theory has expanded from its origins describing the intersection of racism and sexism in the USA to propose that marginalization occurs uniquely at the intersections of any forms of oppression within any cultural context<sup>48</sup>. Experiences of intersectional marginalization have a cumulative deleterious impact on mental health<sup>48</sup>. According to intersectionality theory, TNB individuals who experience additional forms of marginalization, such as racism, classism, xenophobia and ableism have a higher risk of adverse health outcomes and face greater barriers to obtaining the necessary support and resources. Even though a focus on disparities can highlight important areas of focus for policy, it often skims over the deeper issues regarding why disparities exist and how they are enacted to create inequities and inequalities for trans people. Critical theory, a philosophical approach to understanding and experiencing culture and one of the driving theories of the framework of intersectionality, focuses on how gender has become racialized based on colonial traditions<sup>49,50</sup>. Critical theory can help to provide historical context for the current state of gender-based oppression.

Concurrent with increasing attention to intersectional marginalization, research on health disparities specific to TNB people has expanded to include consideration of structural and systemic factors. Minority-stress theory provided an initial framing in its articulation of stressors as internal and external; subsequent scholarship has further placed anti-trans stigma within a socioecological model to describe how stigma manifests at all levels, from internal to structural and systemic<sup>44,51,52</sup>. Many of the internal stressors outlined by minority-stress theory — such as internalized attitudes, identity non-disclosure or concealment, and stigma avoidance — can be described as individual-level forms of anti-trans stigma<sup>52</sup>. By contrast, interpersonal-level external forms of stigma include discrimination in healthcare and workplace settings, rejection by family members, and acts of violence<sup>52</sup>. Finally, structural-level forms of stigma include anti-trans policies and enforcement practices<sup>53,54</sup> (such as policies restricting the use of public restrooms to sex assigned at birth<sup>55,56</sup> and legal name and gender change on identity documents<sup>57</sup>), as well as barriers to accessing competent and affirming healthcare and lack of provider education and training<sup>58,59</sup>. Building on this model to identify interventions for addressing anti-trans stigma, additional structural-level factors include gatekeeping



**Fig. 1 | An integrated theoretical framework of the predictive factors associated with TNB mental health disparities.** Minority stressors for transgender and nonbinary (TNB) people within a socioecological framework, with internal (proximal) stressors occurring at the individual level, and external (distal) stressors occurring at the interpersonal as well as structural and systemic levels. The association of minority stressors for TNB people with adverse mental health outcomes is explained in part by general psychological mediation processes. This framework integrates minority-stress theory<sup>29</sup> and psychological mediation theory<sup>60</sup> within a socioecological framework<sup>51</sup> to explain contextual factors that drive documented mental health disparities within TNB populations. Mental and behavioural health disparity outcomes are on the right. A series of concentric yellow circles depicts the varying levels at which stigma-related stressors occur, from individual and internal, to interpersonal and external, to structural and systemic, as predictors on the left. PTSD, post-traumatic stress disorder.

practices within psychology, the erasure of non-binary individuals in discourse related to trans health, and the tendency to limit dissemination of new knowledge to academic outlets (for example, peer-reviewed journals and academic conferences)<sup>51</sup>.

Another broad theoretical framework that builds upon minority-stress theory and intersectionality theory is the psychological mediation framework<sup>60</sup>. This framework proposes a number of general psychological processes that mediate how and why stigma contributes to mental health concerns. For example, high levels of rumination, emotion dysregulation, hopelessness, and poor self-esteem and self-worth have been associated with depression, anxiety and substance use in sexual-minority adults and adolescents<sup>61–64</sup>. According to the psychological mediation framework, stigma experiences trigger adverse general psychological processes, which in turn lead to the formation and maintenance of adverse mental health concerns in individuals with stigmatized identities. Shame and hopelessness<sup>54,65,66</sup>, and rumination<sup>67–69</sup> mediate the relationship between anti-trans stigma and depression, anxiety and general psychological distress.

Additional theories, such as objectification theory<sup>70</sup> and the interpersonal theory of suicide<sup>71,72</sup>, have been integrated to investigate the mediating variables between various forms of minority stress and psychological outcomes such as suicide ideation and risk as well as disordered eating. In one example, thwarted belongingness

and perceived burdensomeness — key predictive factors in the interpersonal theory of suicide — were mediators of internal minority stress with suicidal ideation among trans adults<sup>73</sup>. Much of this literature, based predominantly in the USA, has been limited in its ability to determine temporality by its reliance on cross-sectional measurement<sup>74</sup>. However, longitudinal research also finds mediation effects of psychological processes in explaining the relations of gender minority stress with adverse mental health outcomes among TNB people. In one example, a longitudinal mediation study conducted in the USA with a subsample of trans women found that when data regarding participants’ experiences of victimization, microaggressions and internalized stigma were collected at baseline, rumination measured six months later mediated their relationship with depression one year after baseline<sup>68</sup>.

These major theories are readily integrated and should be considered additive (FIG. 1). The psychological mediation framework<sup>60</sup> identifies general psychological processes at the individual level, minority-stress theory<sup>27–29,75</sup> proposes specific individual (internal or proximal) and interpersonal (external or distal) stressors as driving adverse mental health outcomes, complemented by further structural and systemic factors<sup>51</sup>. Critically, interpersonal and individual-level stigma occurs within the larger context of the structures and systems in which an individual exists; this larger context in turn shapes the specific ways in which stigma

manifests at lower levels and the general psychological processes that might be triggered for an individual.

### Mental health disparities

Stigma-based stressors are associated directly and indirectly with mental health disparities in depression, anxiety, post-traumatic stress disorder (PTSD), self-harm, suicidality, disordered eating and substance use in TNB individuals. With prevalence rates of some mental health concerns in TNB individuals far exceeding rates in cisgender individuals, researchers have drawn upon socio-cultural theories to identify the risk factors driving these disparities.

Depression and anxiety are amongst the most prevalent mental health disparities for TNB people when compared with cisgender people. Cross-sectional estimates indicate that 28% to 68% of TNB samples within the USA report clinical levels of depression<sup>31,76–78</sup>, whereas depression prevalence globally is estimated at 3.8% (REF.<sup>79</sup>). Cross-sectional rates of anxiety range from 17% to 68% within samples of TNB individuals from the USA and Europe<sup>76,80</sup>. In a direct comparison using longitudinal analyses, data were collected from transgender adults in the UK who were interested in (but had not yet begun) taking hormones at the time of data collection. Of the transgender adults in the sample, 23.9% were diagnosed with depression, compared to only 4.5% of matched general-population cisgender adults<sup>81</sup>; 36% of the transgender adults were diagnosed with anxiety, an almost threefold increased risk compared with cisgender adults<sup>82</sup>. Notably, after beginning gender-affirming hormones, depression among TNB individuals decreased relative to baseline, although anxiety did not<sup>82</sup>. Estimates vary regarding the degree of prevalence of depression and anxiety in TNB populations and some findings are limited by small sample sizes or measurement concerns. Small sample sizes limit the generalizability of findings and can underestimate the actual effects in the data. Furthermore, most general psychological measures were not normed with transgender populations in mind and some can include gendered language that is not appropriate or is out of date. Despite these limitations, TNB individuals clearly report depressive and anxiety symptoms at far higher rates than cisgender individuals.

Further mental health disparities can be considered more serious and persistent. Rates of PTSD in TNB individuals range from 17.5% to 45% within the USA<sup>83–86</sup>, higher than in the general population (5–10%; REF.<sup>87</sup>). In a 2021 USA-based study, 44% of transgender or nonbinary participants met DSM-5 criteria for PTSD<sup>33</sup>. Some of the symptoms of PTSD can be debilitating<sup>88</sup> and increase risk for substance use, depression and additional post-traumatic stress in TNB populations<sup>77,84,85,89–93</sup>.

Beyond the risks related to PTSD, the rates of self-harm and suicidality in TNB populations create a public health crisis<sup>94</sup>. In a study focused on self-harm and suicidality among 392 TNB adults living in Aotearoa/New Zealand or Australia, 10% of the sample had attempted suicide in the previous year and 40% had previous lifetime attempts; 25% of the sample had engaged in self-harm over the previous month and 75% of the sample had engaged in self-harm at some point in

their lifetime<sup>95</sup>. Compared to cisgender adults in the same study, TNB individuals were at least twice as likely to attempt suicide<sup>95</sup>. Furthermore, in data collected in the USA by the Veterans Health Administration between 1999 and 2016, transgender adults had more than twice the risk of suicide completion compared to their cisgender peers<sup>96</sup>. Among college students in the USA, 64% of trans men and trans women and 66% of nonbinary individuals who were included in the Center for Collegiate Mental Health's database contemplated suicide, and 45% of trans men and trans women and 48.7% of nonbinary individuals reported lifetime suicide attempts<sup>97</sup>. Although the level of risk for suicide attempts and ideation varies within TNB populations, prevalence rates in the USA are consistently and strikingly higher than estimated lifetime prevalence in the general population of 4.6% for suicide attempts and 13.5% for suicide ideation<sup>98</sup>.

Within-group differences in suicide risk also exist at the intersections of race, socioeconomic status<sup>99</sup> and age. These individuals are disproportionately affected by intersectional marginalization and barriers to care. In the US Trans Survey, 40% of individuals reported having ever attempted suicide, and notable within-group race disparities emerged: 37% of white respondents reported having ever attempted suicide, compared with 47% of Black respondents, 45% of Latinx respondents, 50% of multiracial respondents, and 57% of American Indian respondents<sup>100</sup>. Disparities in suicide attempts and ideation in trans youths indicate that policies, attention and interventions for young people should be a priority. For example, a USA population survey reported that 50.8% of trans boys, 41.8% of nonbinary youths, and 29.9% of trans girls reported suicide attempts, compared to 17.6% of cisgender girls and 9.8% of cisgender boys<sup>101</sup>. Additional studies in the USA<sup>102</sup> as well as Canada<sup>103</sup> and Thailand<sup>104</sup> found similar results. In another study, 16.7% of TNB youths who lived in Massachusetts (USA) for at least three months out of the year reported engaging in self-harm compared to 4.4% of cisgender youths<sup>105</sup>.

Linking these disparities to minority-stress theory, exposure to discrimination in various forms (such as in housing, employment and healthcare) has been positively associated with depression and anxiety in samples of TNB adults in the USA, Canada, Pakistan and China<sup>31,32,99,106–111</sup>. Similarly, anti-trans bias and non-affirmation, such as being misgendered by others, have been associated with a diagnosis of PTSD<sup>33,84</sup>. Harassment, trauma and sexual assault have been positively associated with self-harming behaviours in TNB individuals in the USA<sup>97</sup>. In addition, prejudice and victimization experiences have been linked to suicidality among TNB adults in the USA. Specifically, TNB individuals who have experienced gender-related victimization are three to four times more likely to have a history of one or more suicide attempts compared to those who have not experienced gender-related victimization<sup>112,113</sup>. Similarly, rates of suicidal ideation for TNB individuals in North America with histories of victimization range from 33% to 47% within the preceding year<sup>114</sup> and 82% to 97% over one's lifetime<sup>115</sup>. Large within-group differences exist among USA-based TNB individuals across race and ethnicity. TNB people of colour (POC),

particularly Indigenous or Native, Black or African American, Latine or Latinx and multi-racial TNB adults, report far higher rates of discrimination, experiences of harassment and violence, housing instability and homelessness, and incarceration and arrest, compared to their white TNB peers<sup>100</sup>.

Disordered eating behaviours also occur at higher rates among TNB individuals than in cisgender populations<sup>115–117</sup>. For example, in a study of Canadian youths and young adults, nearly half of 14–18 year olds and more than a third of 18–25 year olds reported engaging in disordered eating behaviours, such as binge eating or fasting, or using pills, laxatives or vomiting to lose weight<sup>117</sup>. Although the most commonly reported behaviours were binge eating and fasting to lose weight (42%), in a provincially representative survey of 30,000 youths, 18% of adolescents reported vomiting to lose weight, (the majority of whom identify as cisgender<sup>118</sup>). Additional disparities exist between transgender and cisgender youths in purging, caloric restriction, excessive exercise and muscle building<sup>119</sup>. Risk for disordered eating might be higher for nonbinary people and for people assigned female at birth compared to other groups within the TNB population in the USA<sup>116</sup>. Anti-trans discrimination and dehumanization are directly related to disordered eating<sup>120,121</sup> and internalized transphobia has both direct and indirect links with disordered eating<sup>122</sup>. The pathways through which internal and external minority stressors are related to disordered eating are complex. For example, TNB people might use disordered eating as a way to reduce or emphasize physical attributes to create more alignment with their gender identity<sup>123</sup>. Data also indicates that when trans men reported higher internalized societal body standards of attractiveness, they engage in more compulsive exercise and show greater body dissatisfaction<sup>124</sup>.

An additional health disparity for TNB populations includes the use of substances to cope with distal and proximal stressors. According to studies conducted in the USA, transgender and nonbinary youths and adults use substances at higher rates than their cisgender counterparts<sup>125,126</sup>. USA-based research focused on TNB adults' substance use has also demonstrated a direct positive relationship with minority-stress experiences. For example, experiencing more discrimination is directly related to using more substances<sup>31,90,127</sup>.

In summary, rates of depression, anxiety, PTSD, self-harm, suicidality, disordered eating and substance use are disproportionately high in TNB populations compared with cisgender populations. Distal and proximal minority stressors account for a large proportion of these mental health disparities. However, there are probably proximal and distal factors that researchers have missed because the minority-stress model was theorized on lesbian, gay and bisexual populations<sup>128</sup>. In addition, studies focusing on TNB people and minority stress typically only focus on distal stress — specifically discrimination — as an explanatory factor for mental health disparities. Researchers have yet to test the full theory (including coping factors, prominence, valence, integration and multiple forms of oppression). Also, research samples of TNB people are largely of white

individuals, which limits generalizability. Similarly, most research on TNB mental health disparities is conducted in the USA (along with Europe, Canada and Australia), which further limits the generalizability of the research to TNB individuals across the globe.

### Protective factors and well-being

A growing body of literature has focused on resilience and resistance to stigma, coping strategies, and factors that promote well-being in TNB individuals. Research in this area has predominantly investigated individual-level strategies for reducing distress and promoting well-being, with less focus on interpersonal and community-level factors. Research in this area can be further divided in its focus on investigating factors that protect against negative outcomes, and those that promote positive psychological functioning and well-being.

**Factors protecting against negative outcomes.** TNB individuals use individual-level strategies to cope with difficult experiences, including anti-trans stigma. For example, one qualitative study revealed that prior to transitioning, participants used more avoidant cognitive and behavioural strategies, such as using substances, denying one's identity, use of negative metaphors, and hiding one's identity from others<sup>21</sup>. However, as gender transition progressed, participants used more facilitative coping strategies, such as positive metaphors and meaning-making, alongside behavioural strategies such as obtaining support and engaging in activism. These qualitative findings were echoed in a quantitative study of USA-based transgender adults in which participants largely used more individual and interpersonal functional coping strategies in response to gender-based stress than they did dysfunctional strategies. Together, these studies suggest that TNB adults employ positive and proactive strategies for coping with anti-trans stigma and oppression, drawing on internal strengths and resources as well as interpersonal and community-level supports.

Intersections of racism with transphobia create particularly virulent forms of anti-trans stigma, with TNB POC disproportionately the targets of acts of violence and hate compared to their white TNB peers<sup>100</sup>. Qualitative research centring the experiences of TNB POC has identified additional coping and resilience strategies for mitigating the harms associated with intersectional oppression, such as cultivating spirituality and hope for the future, recognizing intersectional oppression, and providing space to evolve simultaneous self-definition of one's identities and having pride in them<sup>22</sup>. Although this study framed resilience as an individual-level attribute, the findings also revealed the critical importance of collective factors — such as TNB POC communities and activism — as essential for reducing the harms associated with identity-based trauma and oppression<sup>22,129</sup>.

Particularly for TNB individuals who experience marginalization at the intersection of multiple forms of oppression, community and collective factors might also play a critical part in attenuating harm and promoting well-being. A major source of strength and

support for many TNB individuals is the TNB community itself<sup>83,130–132</sup>. The TNB community, or online or in-person involvement with individuals who have shared ties of being TNB, is considered essential to identity development processes. In one study, trans identity development was framed around two major themes: the need to be witnessed by others for who one is and the need to see one's self mirrored in the eyes of others who one resembles<sup>133</sup>. When both of these needs are met, trans people are able to survive and thrive<sup>133</sup>. Many TNB individuals, and particularly TNB youths, seek out connection, information, and other forms of support via social media<sup>131,134–136</sup>, where community members can provide emotional support, validate each other's experiences, and share information related to navigating health decisions and educating family and friends<sup>131</sup>. Perceived connectedness to the TNB community has been negatively associated with psychological distress<sup>30,137</sup> and positively associated with psychological well-being. We note that these findings relate to predominantly white samples<sup>83,138,139</sup>.

Different aspects of social support might be beneficial for TNB POC individuals. For example, in a sample of Black and Latinx transgender women, perceived emotional connection to trans community was not associated with PTSD and depressive symptoms<sup>93</sup>. However, in a mixed methods study of Black transgender women, participants' quantitative perceived emotional connection to their community largely provided a benefit to mental health (although the study's small sample size limited the statistical conclusions)<sup>140</sup>. Qualitatively, participants described assistance in meeting tangible needs (such as peer support in learning how to apply makeup and help in connecting to affirming community resources and services) as being critical to mental health<sup>93</sup>. These findings echo earlier studies indicating that support from same-gender and same-race peers is critically important for TNB POC youths and adults<sup>22,129,141</sup>. Thus, instrumental forms of support that directly act on or are in response to structural barriers are likely to have stronger effects than emotional social support alone.

Family support can also be vital for the mental health of TNB people, particularly for youths. When present, family support is associated with lower levels of self-harm, psychological distress, and depression and anxiety symptoms, and higher levels of resilience, self-esteem and life satisfaction among youths and young adults<sup>142–145</sup>. Indeed, family support has unique effects on mental health and well-being outcomes compared to other forms of support. In one study, family support had a greater negative predictive impact on depression and anxiety scores even though participants reported higher levels of friend support and community connection than family support<sup>146</sup>. Taken together, research in this area highlights the numerous factors that can buffer poor mental health outcomes for TNB individuals.

**Factors promoting thriving and well-being.** Conceptualized on two separate continua<sup>147</sup>, psychological well-being is distinct from merely the absence of psychological distress. Research has directly investigated various aspects of positive identity and psychological

well-being in TNB people<sup>148–154</sup>. In a qualitative study of the advice TNB youths and young adults would offer to other TNB youths, themes centred on aspects of positive identity development and connection<sup>152</sup>. Specifically, the advice included encouragement to find the positive aspects of being trans, look to the future, have pride and self-assurance in one's gender, be authentic, trust the process and know that one is not alone. A study with adult trans men identified seven major themes of internally derived positive emotions: confidence, comfort, connection, feeling alive, amazement, pride and happiness<sup>150</sup>. These emotions were responses to positive interpersonal experiences, creating a virtuous cycle; internally derived and interpersonally responsive emotions also acted to strengthen participants' trans identities.

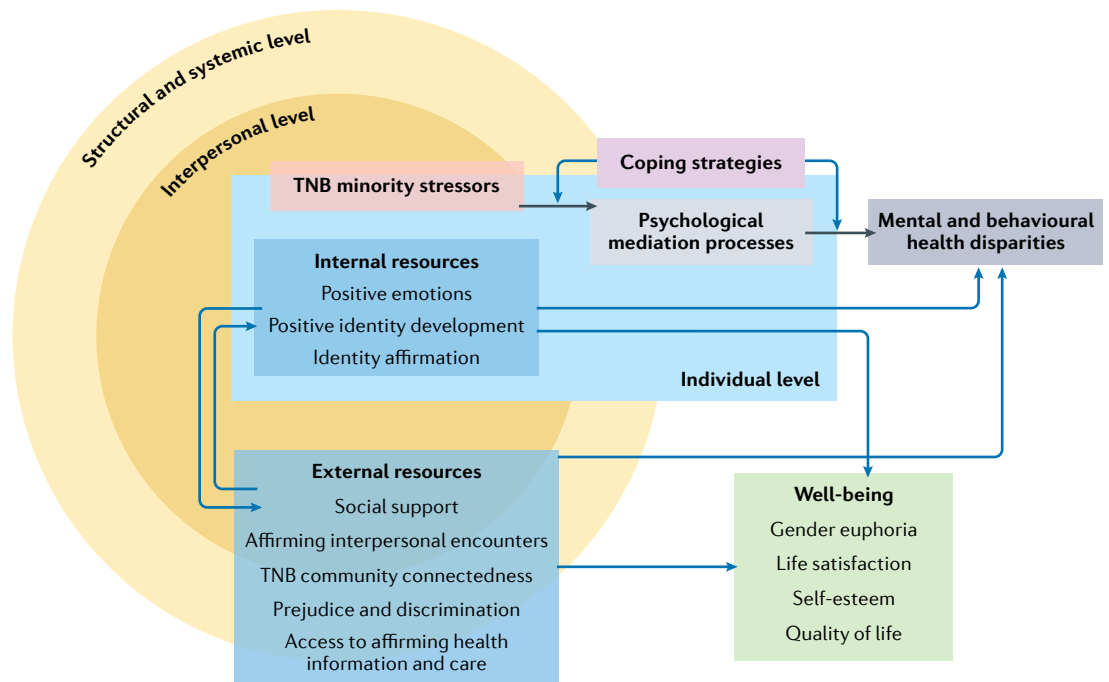
One particularly salient aspect of well-being for TNB populations is gender euphoria<sup>148,149,155–157</sup>, a concept that originated in and is used most frequently within TNB communities themselves<sup>148,149</sup>. Gender euphoria is a feeling of joy and rightness in one's gender<sup>148</sup> and the increased subjective well-being that comes from gender affirmation<sup>157</sup>, which can occur in response to external, internal, and social experiences. The relationship between gender dysphoria and gender euphoria is complex<sup>148</sup>. Gender euphoria is not merely the absence of gender dysphoria, but rather a conglomeration of positive emotions and subjective well-being in response to being affirmed in one's gender. This construct speaks to the self-determination of TNB people in defining TNB identity and experience in terms that eschew pathologization and medicalization, and instead prioritizes trans joy, contentment and fulfillment.

These protective factors can be integrated into the overarching theoretical framework previously presented (FIG. 2). Although some protective factors occur at only one level, such as positive identity development at the individual level and family support at the interpersonal level, others are more recursive. For example, connecting with other TNB individuals often provides strong interpersonal level support, but can also be profoundly affirming at an internal level. Protective factors have negative associations with mental health outcomes but can also act to promote well-being. Consistent with the two-continua model of mental health<sup>147</sup>, this integrated framework separates adverse mental health from well-being.

### Affirming interventions

A growing body of research and scholarship focused on prevention and intervention strategies for mental health concerns in TNB individuals. Medical interventions, psychosocial identity affirmations and psychotherapy reduce mental health concerns and promote health and well-being (TABLE 1). The majority of interventions target factors at the individual, and to a lesser degree, the interpersonal level.

**Medical interventions.** Gender-affirming medical interventions for TNB populations most often include hormone therapy, chest or breast surgeries, genital surgeries, facial surgeries, hair removal, and/or voice therapy. These medical interventions have a strong positive



**Fig. 2 | Protective and health promotive factors associated with well-being and decreased adverse mental health.** Protective and health promotive factors (internal and external resources) are placed within the integrated theoretical framework of FIG. 1. Internal and external resources are recursively related and increase well-being and reduce adverse mental health. Coping strategies are moderators of the relations of minority stressors for transgender and nonbinary (TNB) people with adverse mental health. Protective and health promotive factors counteract minority stressors for TNB people, comprising population-specific factors associated with mental health and well-being in TNB populations.

impact on well-being. Initial studies focusing on the psychosocial impact of gender-affirming medical interventions included small samples of cross-sectional data from transgender patients primarily in the USA and western Europe<sup>158–161</sup>, followed by more robust studies confirming these results with larger samples<sup>162</sup> and longitudinal data<sup>163</sup>.

Research studies, meta-analyses and systematic reviews have consistently found that medical interventions directly reduce gender dysphoria, depression and anxiety symptoms, and general psychological distress, as well as improve self-esteem and quality of life<sup>157,164–180</sup>. With the links between disordered eating and negative body image<sup>120,181</sup>, gender-affirming interventions have also been associated with reduced risk for disordered eating. For example, in one USA-based study, trans men and women reported lower scores on eating disorder questionnaires when they engaged in both hormone therapy and surgeries<sup>182</sup>. In another study, hormone therapy alone appeared to assist with alleviating eating disorder psychopathology after controlling for factors regularly correlated with eating disorders<sup>183</sup>. However, greater scientific rigour is needed to understand the temporality and magnitude of effects of gender-affirming medical interventions on TNB mental health.

**Identity affirmation.** Gender-affirming psychosocial interventions have largely focused on promoting positive TNB identity, building social support, addressing minority stress, and decreasing maladaptive cognitive

processes (TABLE 2). Social support often shows the largest effect sizes in negatively predicting depression and anxiety<sup>76,137,184</sup> and suicide risk<sup>185–187</sup> among other predictors such as positive identity development<sup>83,188</sup> and use of facilitative coping strategies<sup>21,76</sup>. Several interventions have specifically targeted social support to improve mental health and well-being<sup>189,190</sup>. In one pilot study, an online intervention to assist parents in providing social support to their TNB children in the USA, the intervention was feasible and improved parental support. This intervention is currently being tested in a larger, sufficiently powered efficacy study<sup>190</sup>.

In another study in the USA, an online intervention to reduce internalized transnegativity as a way of affirming one's identity in trans adults reduced shame and increased pride in participants' TNB identity<sup>191</sup>. In-person interventions also demonstrate improvement in well-being from specific psychosocial activities. For example, exploratory results from a strengths-based pilot study found an increase in participants' positive identity and well-being after interventions promoting the positive aspects associated with having a TNB identity<sup>151</sup>. In another pilot study, a non-psychotherapy cognitive-behavioural therapy coping skills group intervention significantly reduced depression scores in TNB youth at post-intervention and three months later (although scores remained in the severe range)<sup>192</sup>.

Although the majority of identity affirmation interventions have targeted factors at individual and interpersonal levels, emerging research considers the association



of trans-related policy and legislation with the mental health of TNB people. Efforts toward passing anti-trans legislation exacerbate the harmful impact of interpersonal forms of discrimination and harassment, whereas legislation extending protections helps to reduce the harms associated with anti-trans stigma<sup>53,54</sup>. Particularly noting issues of equity in the USA at the intersections of gender, socioeconomic status and race, one study found that trans women of colour who had completed a legal name change had higher incomes and greater health-care utilization than those who had not<sup>193</sup>. Although this cross-sectional study does not permit causal inferences, it does begin to address structural components affecting trans women of colour and justifies future research into the impact of systemic interventions. In sum, affirming the identities of TNB people is important for both their mental and physical health. Like most research in this area, there are limitations in this study that suggest recommendations for future research, such as conducting longitudinal studies and using experimental designs.

**Psychotherapy.** Scholarship to date on mental health interventions has largely been conceptual. However, psychotherapy can be a particularly useful individual and interpersonal support for TNB identity and transition processes, supporting positive and facilitative strategies for coping with oppression and navigating minority stress. A growing body of scholarship has outlined TNB-centred interventions and treatment modalities for use with TNB individuals<sup>194,195</sup>. For example, dialectical behavioural therapy can be used with TNB clients who are working through the consequences of experiencing identity invalidation from others<sup>196</sup>. Similarly, the transgender resilience intervention model promotes collective healing in several areas (for example, community support, role models, family support) with specific psychotherapy interventions to assist with collective healing<sup>197</sup>. Expanding on this model, research suggests that psychotherapy with nonbinary clients should particularly focus on client empowerment and externalizing

negative stigma, and encourage the use of group therapy interventions and active therapist advocacy<sup>198</sup>.

The efficacy of specific psychotherapy interventions and modalities in TNB populations is still largely unknown. However, a randomized controlled trial for TNB clients comparing a minority-stress-focused psychotherapy (plus affirmative psychotherapy) to affirmative psychotherapy alone revealed improvement in longitudinal mental health outcomes; the minority-stress group demonstrated more improvement in minority-stress-related factors, such as a reduction in internalized stigma and non-affirmation experiences<sup>42</sup>. Analysis of psychotherapy sessions indicated that 100% of the clients discussed minority-stress events; the most common external stressor was prejudice and the most common internal stressor was internalized transnegativity<sup>199</sup>. This small evidence base is complemented by ongoing clinical trials with sexual-minority clients, which increasingly include trans and nonbinary clients as measurement of gender has improved and more people identify with these identities<sup>200</sup>.

There is a growing research area focused on group therapy, relationship therapy and family therapy for TNB people. In one study, themes that arose during group therapy with transgender clients included gender norms in society, sexuality and sexual health, personal safety, discrimination, internalized transphobia and gender-related insecurities<sup>201</sup>. In addition to these topics raised by group members, group therapy focused on addressing the desire to conform, coming out, transitioning, and how to address termination as part of the group therapy process. Implications from this study include the importance of processing identity-based information in groups as a way to reduce feelings of isolation.

Relationship therapy can also be an affirming intervention when at least one partner is a TNB individual. In one study of three couples in which all partners were transgender, all three couples demonstrated improved relationship satisfaction after a two-session adaptation of the Marriage Checkup (originally theorized by Cordova<sup>202</sup>)<sup>203</sup>. A systematic review highlighted seven

Table 1 | Affirming medical and identity interventions

Intervention type	Intervention	Outcomes
Gender-affirming medical interventions	Hormones	Reduced anxiety, depression, psychological distress <sup>168,180</sup> , suicidality <sup>165</sup> ; improved quality of life <sup>168,180</sup> , self-esteem <sup>168</sup> , psychological well-being <sup>165</sup>
	Surgeries (such as chest/breast, genital and/or facial surgeries)	Reduced depression, anxiety <sup>179</sup> , suicidality <sup>164</sup> , gender dysphoria <sup>164,179</sup> , rumination <sup>179</sup> ; improved quality of life <sup>164,179</sup> , sex life, body image <sup>169,179</sup>
	Hair removal	Reduced dysphoria, negative affect, depression, anxiety <sup>157</sup> ; improved satisfaction, quality of life, positive affect <sup>157</sup>
Identity affirmation and social support interventions	Family support (for parents of trans youth)	Online psychoeducational programme was highly acceptable and provided useful information to participants <sup>190</sup>
	Positive identity development	Reduced internalized transnegativity, shame <sup>191</sup> ; increased positive identity, pride, well-being <sup>151</sup>
	Coping skills psychoeducation based on cognitive-behavioural therapy (with trans youth)	Reduced depression symptoms <sup>192</sup>

Table 2 | **Affirming psychotherapy interventions**

Intervention type	Intervention	Summary	Outcomes
Conceptual psychotherapy interventions	Dialectical behaviour therapy (DBT)	A biosocial model of treatment distress to focus on transgender clients. Skills focus on challenges with identifying or experiencing a self, emotion dysregulation, interpersonal difficulties, and impulsive or challenging patterns of behaviour <sup>196</sup> .	NA
	Transgender resilience intervention model (TRIM)	Social support, community belonging, family acceptance, participating in activism, having positive role models and being a positive role model are group-level resilience factors. Self-worth, self-acceptance and/or pride, self-definition, hope and transition are individual-level factors that promote resilience. Community, group and individual interventions and their potential influence on resilience are discussed <sup>197</sup> .	NA
	Trans-affirmative narrative exposure therapy (TA-NET)	Three phases: creating historical timelines and determining ‘chapters’ to be used for the second-phase homework assignments; writing chapter narratives to be read aloud and verbally processed; and concluding the autobiography and therapeutic process <sup>194</sup> .	NA
	Gender affirmative lifespan approach (GALA)	Therapeutic interventions designed to promote positive gender identity development through five core components: building resiliency; developing gender literacy; moving beyond the binary; promoting positive sexuality; and facilitating empowering connections to medical interventions, as desired <sup>195</sup> .	NA
Evidence-based psychotherapy interventions	Empowering queer identities in psychotherapy (EQulP)	10-week psychotherapy intervention developed for young gender-diverse sexual-minority women to introduce minority-stress concepts, promote cognitive restructuring, emotional awareness, and emotion regulation, and build behavioural skills to mitigate minority-stress effects.	Reduction in depression, anxiety, substance use, and experiences of minority stressors <sup>200</sup> .
	Trans-affirmative therapy (TA)	12-week psychotherapy intervention focused on employing transgender affirmative psychotherapy techniques, including discussions about pronouns, therapist gender and transgender health psychoeducation.	Reduced symptom distress post-treatment, sustained six months later <sup>42</sup> .
	Building awareness of minority stressors (BAMS)	12-week psychotherapy intervention that combined TA with psychoeducation related to transgender minority stress. Weekly sessions also included prompts to discuss and process up to three minority-stress experiences.	Reduced symptom distress, internalized transphobia and non-affirmation experiences post-treatment, sustained six months later <sup>42</sup> .

primary themes in recommendations for family therapy for transgender youths: incorporating psychoeducation; including space for families to process reactions to their family member’s transgender identity; highlighting the protective influence of family acceptance; using several modes of support; providing families with opportunities to be allies and advocates; connecting families to community resources; and attending to contextual factors, such as additional marginalized identities within the family unit<sup>204</sup>.

In summary, affirming interventions can mitigate the harms associated with anti-trans stigma, ameliorate psychological distress and other adverse mental health outcomes, and promote well-being and positive psychological functioning. It is particularly promising that online intervention research (conducted prior to COVID-19) has shown positive psychological benefits for trans individuals, potentially increasing accessibility<sup>190,191</sup>. The majority of interventions to date have targeted risk and protective factors at the internal and individual level. Although some studies have only measured variables at one level, it is likely that effects supersede levels in dynamic and recursive ways. For example, an intervention targeting internalized trans-negativity by promoting positive emotions and identity

might help to reduce depression symptoms, as well as help individuals connect interpersonally, expanding and strengthening their social network. This expansion can lead to ripple effects in TNB community support and resource sharing, which in turn can promote individual well-being. In this way, intervention research could consider ways to maximize the impact of intervention strategies across multiple levels and to conceptualize dynamic and recursive effects toward improving individual as well as community health.

**Summary and future directions**

As the visibility of TNB people and communities increases, so too will opportunities to expand knowledge to better support their health and well-being needs. Contextual theoretical models and frameworks help to explain the well documented disparities between TNB and cisgender people in mental health and well-being, with research largely supporting the core theoretical suppositions of these frameworks. In this Review, we have presented an integrated framework for understanding risk and protective factors and their impact on mental health and well-being (FIG. 2). However, future research and scholarship should put forward an integrated model of mental health and well-being concerns in TNB people

that outlines the factors driving health disparities, centres well-being and health-promoting processes specific to TNB people, and also integrates developmental considerations for understanding the mental health concerns of TNB people across their lifespans.

We offer several suggestions for future research focused on understanding and reducing disparities. Minority-stress theory was originally developed with sexual-minority people in mind<sup>51</sup> and has not yet been fully adapted to include components specific to gender-related stress. We suggest that researchers conduct in-depth qualitative research to determine the factors that have been missed regarding proximal stressors. This work has begun<sup>46</sup> and should be expanded beyond the construct of gender dysphoria.

In addition, the mediation models that focus on proximal stressors to explain mental health disparities are missing major factors involved in structural oppression, such as policies and institutional components beyond individual interactions. At present, many of the measures used globally were created by North American and European researchers and consider only those contexts. New measures that incorporate the local gendered context in which the research is conducted are essential to understanding gender globally. In turn, this understanding can support recommendations to international organizations that provide recommendations regarding psychosocial and medical interventions.

Outcomes research related to medical interventions, such as hormones, surgeries and hair removal

has improved over time, from cross-sectional correlational designs with small sample sizes, to longitudinal studies with larger sample sizes. Future research should continue to explore individual and contextual factors that might strengthen positive outcomes and mitigate risk for negative outcomes for TNB individuals around the world. For example, researchers should expand the outcomes measured in medical interventions research to include individual psychological as well as interpersonal outcomes. Emerging research has begun to test the efficacy of non-psychotherapy psychosocial interventions (such as psychoeducation) as well as psychotherapy interventions on mental health among TNB people. Results thus far are promising, but a broader array of psychosocial and psychotherapy interventions for individuals and communities across varying levels of resource access is needed. In addition to individual therapy, data are also needed regarding the process and outcomes of group therapy<sup>201,205–207</sup>, relationship therapy<sup>203</sup> and family therapy<sup>204,208</sup>.

The field is at a unique time historically: TNB individuals and communities are gaining visibility, and laws and policies are being changed that influence the rights of TNB people and recognition in unprecedented ways. Researchers and scholars are well positioned to capture these seismic shifts and develop an understanding of how to address health disparities for TNB people and promote their health and well-being.

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#### Author contributions

The authors contributed equally to all aspects of the article.

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