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REVIEW

Minority stress and mental health among LGBT populations: an update on the evidence

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ABSTRACT

INTRODUCTION: In the past five years, researchers have increasingly turned to the study of mental health outcomes in LGBT populations. The present paper summarizes recent literature on the relationship between minority stress experienced by sexual minorities and mental health.

EVIDENCE ACQUISITION: PsycINFO, PubMed, and the EBSCO Psychology and Behavioral Science Collection were searched for papers concerning minority stress and mental health disparities in LGBT populations, published between 1 January 2014 and 30 June 2018. All collected papers were screened using the following criteria: study involving >50 individuals; written in English; focusing on clinical outcomes of depression, suicidality, and substance use in relation to experienced minority stress.

EVIDENCE SYNTHESIS: Sixty-two papers were included in this review. Findings are reported under three main headings: studies primarily focused on depression, studies concerning suicidality and suicide attempts, and papers analyzing the correlation between substance use and minority stress in LGBT populations. The included studies supported the minority stress model as a framework to better explain disparities in mental health outcomes in sexual minority populations. Higher rates of depression, suicidality, and substance use are reported in LGBT populations, as are the related minority stressors analyzed.

CONCLUSIONS: Sexual minorities still face numerous mental health disparities. Research indicates that the levels of minority stressors positively predict mental health outcomes. Specific policies designed to support the civil rights of sexual minorities may help to overcome such inequalities.

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KEY WORDS: Minority health - Mental health - Sexual and gender minorities - Depression - Suicide - Substance-related disorders.

Lesbian, gay, bisexual, and transgender (LGBT) individuals have been historically marginalized within society, and encounter a range of stressors related to being part of a minority group.¹

Health disparities among sexual minority groups, and particularly mental health disparities, are well-documented.² A growing body of

research has proved a higher prevalence of mood and anxiety disorders, suicidality, and substance use among LGBT groups as compared with heterosexuals. Many authors have hypothesized that disparities may result from prejudice and discrimination leading to distress, and one of the prevailing explanatory frameworks that explores this relationship is Meyer's minority stress model.^{3,4}

The term “minority stress” was initially used by Brooks⁵ in a study with a lesbian population in 1981 and is defined as “*a state intervening between the sequential antecedent stressors of culturally sanctioned, categorically ascribed inferior status, resultant prejudice and discrimination, the impact of these forces on the cognitive structure of the individual, and consequent readjustment or adaptation failure.*” Meyer used a similar concept for his minority stress model for LGB populations, and this model has since been expanded to other populations, including transgender people.⁶

By integrating the results of relevant previous research in the fields of sociology and psychology, Meyer’s minority stress theory postulates that LGB individuals suffer several unique minority stressors in addition to the stressors normally experienced by both heterosexual and LGB individuals, as a result of their minority position. These unique minority stressors have a negative impact on the health of LGB individuals. The concept of social stress extends stress theory by suggesting that conditions in the social environment, and not only personal events, are sources of stress that affect the mental health of minorities.

Individuals who belong to minorities may experience conditions such as conflicts, prejudice, discrimination, and stigma due to conflict with the social norms and structure set by the dominant culture for the entire society. According to Meyer, the main factors involved in the minority stress model are: 1) experiencing discrimination and victimization (prejudice event); 2) expectations of rejection and discrimination; 3) concealment of sexual orientation; and 4) internalized homophobia.

Meyer’s model describes a continuum of minority stressors ranging from distal to proximal processes. Distal processes include being victims of prejudice events, including discrimination, violence, and interpersonal homophobia. Among the latter, it is possible to find processes based on individual perceptions and appraisals, such as fear of rejection (rejection sensitivity) and internalized homophobia/biphobia/transphobia, referring to the distressing internalization and endorsement of negative societal attitudes about

one’s sexual orientation or gender identity experienced by LGBT individuals.

Both processes, proximal and distal, may determine negative mental health outcomes, such as increased depression, suicidality, and substance use among LGBT populations.

Importantly, Meyer postulated that coping strategies and social support, such as LGBT community connections at individual and group levels, can mitigate the negative effects of minority stress on mental health outcomes.

More recently, Hatzenbuehler⁷ integrated both group-specific minority stressors and general psychological processes in a single theoretical framework: 1) sexual minorities suffer excess stress exposure caused by stigma; 2) stigma-related stress results in emotion dysregulation, social/interpersonal conflicts, and cognitive processes, increasing the risk of negative mental health outcomes; and 3) these processes mediate the link between stigma-related stress and negative mental health outcomes such as depression, anxiety, and substance use.

In 1973, the American Psychiatric Association (APA) removed homosexuality as a diagnosis within the second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM). This diagnostic revision was the beginning of the gradual shift in cultural attitudes and social change about homosexuality.⁸ Although since then homosexuality has been depathologized and recognized as a normal variant of human sexuality, many mental health professionals still have negative and pathologizing attitudes toward LGBT clients.^{9, 10}

Interventions aimed at changing sexual orientation through so-called “reparative” or “conversion” therapies are still suggested by some mental health professionals, despite being unethical, unprofessional, and potentially dangerous for clients, as many authoritative professional organizations (*e.g.*, the World Psychiatric Association)¹¹ have stated. Interventions may also be influenced by anti-gay prejudice or, more commonly and subtly, simply lack of knowledge about sexual minorities.¹² In a recent paper, Lingiardi *et al.*¹² suggested that mental health professionals should advocate for sexual minorities, peculiarly in societies where they are dis-

criminated on political, institutional, and popular media levels, as well as on a personal level. The study of LGBT populations' mental health has recently increased, with the aim of expanding the knowledge and awareness on this specific issue and suggesting policy interventions (Table I).

Evidence acquisition

A narrative review of the recent scientific literature on minority stress and mental health among LGBT populations was performed, with respect to the following topics: depression, suicidality, and substance use. The search was limited to literature published from 1 January 2014 to 30 June 2018. This timeframe was chosen considering the very rapid growth of research in this field and the link of this topic with recent important socio-cultural changes, in particular in Italy. PubMed, PsycINFO, and the EBSCO Psychology and Behavioral Sciences Collection were searched for papers with the following key words: "minority stress AND LGBT"; "minority stress AND (gay OR lesbian OR homosexual OR bisexual)," "mi-

nority stress AND (transgender OR queer OR gender non-conforming)." The search was restricted to studies published in English, involving more than 50 individuals, and reporting clinical outcomes on depression and/or suicidality and/or substance use. No limitation was posed to the clinical setting of the studies. Exclusion criteria were: absence of clear focus on minority stress, off-topic papers (*e.g.*, organic conditions, minority stress related to ethnicity, etc.), studies focused on prevention, or not reporting clinical outcomes, or with a sample size smaller than 50 individuals. After discarding duplicate records, titles and abstracts were initially screened according to the inclusion and exclusion criteria, and full texts of potentially eligible papers were retrieved. Full-text papers were then screened for their relevance. For each paper finally included in the review, the following information was extracted (Figure 1, Table II,¹³⁻³² III,³³⁻⁴⁹ IV⁵⁰⁻⁷⁴): first author, journal and year of publication, sample size, features of the population included, study design, clinical outcomes, and authors' conclusions.

TABLE I.—*Common terms used in LGBT health.*

Sexual orientation	An enduring pattern of romantic or sexual attraction (or a combination of these) to persons of the opposite sex or gender (<i>i.e.</i> heterosexual sexual orientation), the same sex or gender (homosexual), both (bisexual), or none (asexual).
Gender identity	A person's perception of belonging to a particular gender, which may or may not correspond with their sex assigned at birth.
Sexual minority	A group whose sexual identity, orientation or practice differ from the majority of the surrounding society. Currently identified sexual minorities are comprised of lesbian, gay, bisexual, transgender, gender non conforming, queer and asexual individuals, but this list is by no means intended to be comprehensive.
LGBT	Lesbian, gay, bisexual, transgender
Gay	Generally refers to a male who identifies his primary sexual, emotional and spiritual attraction as being predominantly to other males.
Lesbian	Generally refers to a female who identifies her primary sexual, emotional and spiritual attraction as being predominantly to other females.
Bisexual	Female or male who identifies her or his primary sexual and loving attachments as being with a person of the same or opposite sex.
Transgender	Transgender people have a gender identity or gender expression that differs from the sex assigned at birth. Being transgender is independent of sexual orientation.
Cisgender	A person whose gender identification matches the sex assigned at birth
Transsexual	Transgender people are sometimes called transsexual if they desire medical assistance (<i>e.g.</i> with medication or gender affirming surgery) to transition from one sex to another.
Queer	Letter Q is often added to LGBT to include the term "queer", a word which may be used to describe anyone identifying as non-heterosexual or non-cisgender.
Questioning	An individual who is currently questioning his or her gender or sexual identity.
Heterosexism	The belief that heterosexuality represents the only social norm, as far as sexual behaviors are concerned. Such view may be shared by people, regardless of their sexual orientation. It is therefore linked to both stigma and self-stigma processes. A corollary of heterosexism is that other types of sexual orientation or attractions are considered deviant.

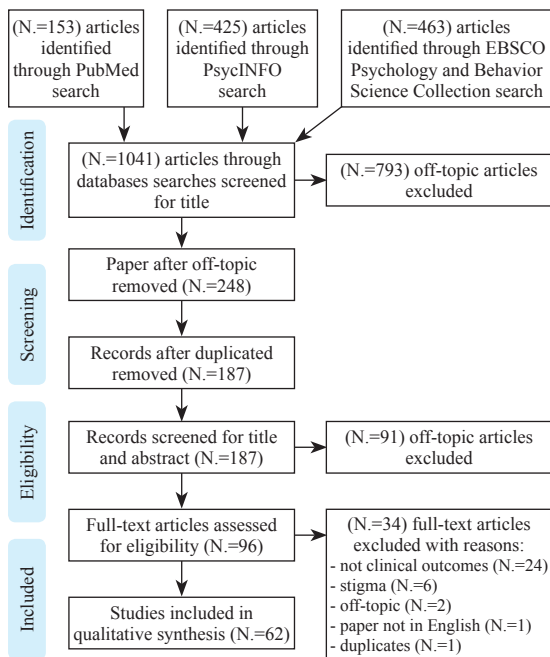


Figure 1.—Flow chart detailing the selection process of papers included in this review.

Evidence synthesis

A total of 1041 articles were extracted: 153 from PubMed, 425 from PsycINFO, and 463 from the EBSCO Psychology and Behavioral Science Collection. Among these, 793 papers were excluded because they were determined to be off-topic after screening the title. Two hundred and forty-eight papers were identified as potentially eligible — 187 records after duplicates were removed. Of the remaining articles, whose titles and abstracts were screened, 91 papers were found to be off-topic. The bibliographic search finally yielded 96 records, and each full-text article was assessed for eligibility. We excluded 34 articles: 24 not reporting clinical outcomes, 6 only focusing on stigma-related topics, 1 paper not available in English, 1 duplicate, and 2 off-topic papers (on ethnic minority). Consequently, 62 articles were found eligible for inclusion: 20 primarily concerning outcomes related to depression, 17 regarding suicidality, and 25 with outcomes related to substance use. Figure 1 shows the selection process followed for this review.

The following provides the narrative summary of findings derived from the studies included,

reported under three main headings: studies primarily focused on depression, studies concerning suicidality and suicide attempts, and papers analyzing the correlation between substance use and minority stress in LGBT populations.

Depression

The global prevalence of depressive symptoms and disorders has increased in the past several decades. Research has pointed out that depression is the leading cause of disability and a significant cause of disease burden worldwide.⁷⁵ The lifetime prevalence of depression ranges from 20% to 25% in women and 7% to 12% in men.⁷⁶

In the past years, multiple studies have examined depression in LGBT populations and reached the same conclusion: minority stressors result in increased levels of depression. It is clearly important to note that mental illness and emotional disturbances are not inherent to LGBT orientations and identities, but rather result from the stigmatization of sexual and gender minority identities.³ This is confirmed by one of the largest studies included in our review, a longitudinal population-based study by Bränström *et al.*,¹³ providing evidence of poorer mental health among LGB individuals as compared with heterosexuals. More frequent experiences of victimization, threat of violence, and lack of social support are linked to these disparities.

The studies included in the present review also provided information on particular sub-groups of sexual minority persons (*e.g.*, the bisexual and transgender populations, as well as older or younger LGB individuals), and on which distal and proximal factors of minority stress may possibly mediate or moderate depressive symptoms in these populations. In a biopsychosocial model of minority stress, Parra and collaborators¹⁴ tested diurnal cortisol slopes (six samples of saliva in a 12-h circadian profile) on a group of 62 gay/lesbian and bisexual young women and men, and found that participants who had experienced more LGB-related stress showed flatter diurnal cortisol slopes (associated with chronic stress) and, in turn, reported more depression. Although the sample of participants was small, these results suggest that LGB-related stress acts simi-

larly to other chronic life stressors, undermining mental health by compromising neurobiological regulatory processes.

Regarding the aging LGBT population, it is interesting to compare two studies that present methodological similarities, but opposite results. Both were based on data from two large longitudinal studies on the natural history of HIV/AIDS in the USA. Pyra *et al.*¹⁵ analyzed longitudinal data from 1811 women with or at risk of HIV taking part in the U.S. Women's Interagency HIV Study (WHIS 1994-2003): depressive symptoms were compared by sexual identity at baseline and ongoing sexual behavior, regularly re-assessed, and then controlled for age, socioeconomic status, history of violence, and substance use. Depressive symptoms were highly prevalent in the sample: at baseline, 45% of heterosexual women, 50% of lesbians, and 56% of bisexuals had clinically significant depressive symptoms measured by the Center for Epidemiologic Studies Depression Scale (CES-D). This was explained in part by low income and high rate of violence, substance use, and HIV infection. However, also in this vulnerable population, sexual minority status was an additional independent predictor of depression. Besides that, the interesting finding was that sexual minority women were at increased odds for depressive symptoms in their early thirties, and at decreased odds after age 55 years, suggesting a different pattern than the classical U-shaped curve for depressive symptoms over the life span. According to this study, it is plausible that youth and young adulthood present a uniquely challenging time for sexual minority women, who then may develop resiliency and coping skills over time.

The second study conducted by Wight *et al.*¹⁶ led to different conclusions, as it examined the association between internalized gay ageism and depression, on a sample of 312 gay men (years range 48-78, 61% HIV-negative) participating in the Multicenter AIDS Cohort Study (MACS) since 1984-85. The authors found that 1) internalized gay ageism could reliably be measured among these men; 2) internalized gay ageism is positively associated with depressive symptoms as a specific and independent factor; and 3) that the "sense of mattering" partially mediates but

does not moderate or "buffer" the association between internalized gay ageism and depressive symptoms. Little is known about how the confluence of these two social phenomena — ageism and homophobia — may be jointly internalized among mid-life and older gay men. It has been noted that some gay men may experience a sense of subjective "accelerated aging," since the gay male community includes a fraction of people who seem to give to youth and physical attractiveness extreme importance. Therefore, many midlife and older gay men feel they are socially invisible and dually stigmatized for both being gay and older. They are also more likely than their heterosexual counterparts to live alone. Aging and ageism within the context of a gay male identity could therefore merit greater consideration in the development of clinical and community-based supporting interventions. This particular topic is also explored by Hoy-Ellis *et al.*,¹⁷ who link internal minority stressors, chronic health conditions, and depression in elder LGB populations. In line with the minority stress model, they found that disclosure of sexual orientation is indirectly associated with chronic physical health conditions and depression, and further chronic physical health conditions have an additional direct relationship with depression. They analyzed the ongoing dilemma of whether, when, where, how, and under what circumstances one conceals or discloses sexual orientation, coupled with the impact of stress processes on health in the older LGB population.

Another subgroup who, according to available evidence, seems to be particularly vulnerable to depression due to peculiar minority stress factors are bisexual individuals. It has been assumed in the past years that stigma associated with bisexuality is a multilevel consequence of dual exclusion, both from the lesbian/gay and the heterosexual communities. These speculations are confirmed by three recent cross-sectional studies. The first one¹⁸ by Molina *et al.* involving 470 self-identified bisexual women focused on the mediating roles of bisexual-specific minority stressors on differences in depression and alcoholism: their findings suggested that women with a single male partner and women with multiple female and male partners were particularly vul-

nerable to both conditions. Different outcomes were found according to partner number and partner number/gender, mediated by experienced bi-negativity. An important limitation of this paper was that the sample contained relatively few women with only female partners (N.=56), since these subjects identified themselves as lesbians at some point in the data collection, and were therefore excluded from the sample. A second hypothesis is that the stigma from the gay/lesbian community may lead to a decreased willingness for lesbian women to date openly bisexual individuals, limiting the number of bisexual women with only female partners.

The second study¹⁹ by Pakula *et al.* pooled data from a large, national, multi-year sample of Canadians aged 18-59 years who self-identified as lesbian, gay, bisexual, or heterosexual (N.=222,548). The results showed that the sexual minority respondents were significantly more likely than the heterosexual respondents to describe their lives as stressful and their sense of belonging to a local community as weak. This gap was particularly evident for bisexual individuals, who showed the highest prevalence of mental health problems (*i.e.*, anxiety disorder, mood disorder, mood and anxiety disorder, mood or anxiety, and heavy drinking). This implicates that bisexual-identified people may be more likely to experience social stress due to the “double discrimination” of homophobia and biphobia, and are less connected to the LGBT community. Therefore, they may benefit from various forms of social supports more than others. Social and familiar supports themselves have been the object of a growing amount of publications aimed at identifying potential protective factors that can contribute to developing resilience and buffering the impact of minority stress on LGBT individuals.

The third study by Lambe *et al.*²⁰ focused on internalized bi-negativity as a predictor of self-esteem and depression in bisexual women, and provided evidence that regular participation in a bisexual-specific community (*i.e.*, 1-3 times per week) reduced the impact of internalized bi-negativity, confirming it as a potential protective factor for depressive symptoms.

The cross-sectional study²¹ by Feinstein *et*

al. on 414 lesbian women and gay men (age range=18-67) showed that parental acceptance moderates the association between depression and more proximal minority stressors, such as internalized homonegativity and rejection sensitivity. It does not moderate the association between distal factors, such as experienced discrimination. It is worth noting that this moderation effect did not replicate with general family support. These findings suggest that: 1) feeling loved and supported by parents may facilitate the development of self-confidence and relational security; and 2) it may be more important to know that your parents accept your sexual orientation compared to perceiving that your family provide you with general support. So, it may be particularly important for parents to express to their sexual minority child that they accept their sexual orientation.

Cerdà *et al.*²² focused on determinants of neighborhoods that may affect sexual minorities' mental health. The data came from a cross-sectional study on a population-based sample (New York City area) of MSM (men who have sex with men). The study suggested that, among urban MSM, the “social” neighborhood, rather than their “home” neighborhood, has a particularly important influence on anxiety (and potentially on depression). The salience of social neighborhood for MSM may be due to the lack of congruence between the places where MSM choose to live and those where they socialize. This may reflect a broader issue that affects sexual minorities, who choose to socialize away from home if they describe their living place as not supportive, or if they are concealing their sexual orientation. Extending research in a different social context than the more frequently explored large metropolitan areas, McCarthy and collaborators conducted a cross-sectional survey in Nebraska, a state well-known for being rather conservative.²³

The results showed that self-acceptance, being married/partnered, and being older were protective factors toward the outcomes (depressive symptoms measured with CES-D scores), while being female and perceived discrimination were risk factors for depression. Another cross-sectional survey by Marsak *et al.* recruited 771 participants specifically from rural areas across

the US.²⁴ Three different scales were used to measure different aspects of stigma: internal (internalized stigma) or external (anticipated and enacted). While all three measures of stigma were significantly associated with increased depression scores, enacted stigma and anticipated stigma had respectively the highest possible score and highest mean score, suggesting that in rural sexual minority populations the adverse mental health effects occur whether or not the stigma is experienced or perceived. This study has another interesting finding: individuals who reported their sexual orientation as bisexual or “queer” had higher mean stigma and depression scores than their gay/lesbian counterparts. This evidence is consistent with the papers we reviewed on bisexual sub-groups.

Concerning the transgender population, a 3-year (2004-2007) prospective study conducted by Nuttbrock *et al.*²⁵ among 230 transgender women aged from 19 to 59 years observed a significant association of psychological and physical abuse with major depression during follow-up. The association with psychological abuse was stronger among younger than among older transgender women, suggesting that 1) gender-related abuse is endemic in this population; and 2) transgender women seem to improve resilience with psychological but not physical abuse as they grow older. The reasons for this better resilience are not well understood. It could be that the sense of accomplishment accompanying transition may ameliorate the psychological toll of concealment, which is gradually replaced by a more facilitative, problem-solving coping style.²⁶ The negative aspect of this assumption is that gender-identity discrimination (especially when it comes to employment) is unfortunately so commonplace that older transgender adults consider it a “normal” part of their lives. Results from Pflum *et al.*,²⁷ including 865 transgender and gender non-conforming adults (TGNC) in their study, found that social support and connectedness to the TGNC community can positively impact psychological well-being, facilitate resilience, catalyze the use of healthy coping strategies, and predict lower symptoms of depression and anxiety.

Lastly, there is a growing amount of research

on the effects of minority stress on youth, in order to identify predictive factors and protective factors for depression that could help structure both school-wide and individual prevention and intervention strategies.

Baams *et al.*²⁸ found that for all the LGB youth sample enrolled in their study, experiences of victimization negatively impacted levels of depression and suicidal ideation, and this relation was mediated by the experience of “feeling like a burden” to others in their lives (so-called “perceived burdensomeness,” a key mechanism for suicidality according to Joiner’s interpersonal-psychological theory of suicide^{77, 78}). This association was also present for coming-out related stress, but only in the mediation model of LB girls. It may be that girls are more attuned to others’ reaction to their coming out, whereas GB boys experience higher levels of sexual orientation victimization that could simply overpower the weight of outness-related stress.

Similar conceptual disparities between young LGB boys and girls were also found in a Dutch study²⁹ that collected data from a large longitudinal cohort study (TRAILS study, range age: 11-22 years). By testing if self-reported peer victimization and parental rejection mediated the association between sexual orientation and depression, the authors found that lesbian girls and bisexuals (who were mostly girls in the sample) were at increased risk of depressive symptoms already at age 11, and this difference increased over time. Furthermore, self-reported peer victimization mediated the association for both boys and girls, while the effect of parental rejection was significant only for girls and bisexuals. One explanation could be that, during adolescence, the “heightened affiliative need” shown by girls could worsen the effect of minority stressors on a population who is already more vulnerable to depressive symptoms.

When it comes to specific mechanisms of resilience, Bruce *et al.*³⁰ offer a path model that underlies the buffering effects of friendship networks, rather than parental support, for gay male youth. From this perspective, a lack of connection with other members of the larger LGB community may restrict young persons from accessing resources that could aid in the development

of a positive identity and serve as a resilience resource when faced with marginalization in other settings (e.g., family).

A cross-sectional study³¹ by Lindquist *et al.* on 297 LGBT young adults (age range: 18-22 years) showed that high school and current community support, childhood trauma, victimization, and negative attributional cognitive style were significant predictors of current depressive symptoms. In particular, global attributions were the most predictive, suggesting that they may provide an overwhelming sense of hopelessness. Therefore, in addition to school-wide interventions that target bullying behaviors and ensure school safety, also specific individual interventions might be implemented, such as cognitive restructuring intervention techniques, aimed to modify negative attributional styles. This may protect LGBT youth from depression, providing them with a greater sense of agency.

In a broader view, it is important for health-care providers to become more culturally competent with respect to their LGBT patients, and to create a welcoming environment for them. This can be done by using inclusive language in psychotherapeutic/clinical settings (e.g., using the word “partner” instead of “husband/wife”), or by fostering a greater sense of authenticity and integration that may support the exploration of coming-out and disclosure processes.¹²

Finally, the quasi-natural experiment of Everett *et al.*³² concerns the effect of civil union legalization on sexual minority women’s perceived discrimination and depressive symptoms. State legislation legalizing same-sex civil unions was associated with lower levels of stigma consciousness, perceived discrimination, depressive symptoms, and hazardous drinking, especially among racial/ethnic minority women and women with lower levels of education, suggesting that supportive policies for the civil rights of sexual minorities may improve the health of all sexual minority women, especially those with multiply marginalized statuses (Table II).

Suicidality

Suicide is a global phenomenon, and occurs throughout the whole lifespan of individuals. It is the second leading cause of death among youth

globally. A recent report of the World Health Organization stated that belonging to a sexual minority was a risk factor.⁷⁹ Depression being another very relevant risk factor for suicidal behaviors, the higher prevalence of depression among LGBT populations, as documented previously in this paper, can be considered in itself a risk factor for suicide.

The association between suicidal behaviors and sexual minority status is well established. Meta-analysis data have found that suicide attempt rates are between 20% and 42% among individuals in a sexual minority position.⁸⁰ The “Trans Mental Health Study”⁸¹ is considered the largest survey concerning the UK trans population (N.=889). It helped to shed new light on issues the transgender population face and consequences on their mental health. According to Bailey *et al.*,³³ the survey highlighted that trans people are up to seven times more likely to attempt suicide than average, the majority through self-poisoning. However, many fears and negative thoughts were reported to be linked to the pre-transition period, while suicidal ideation and attempt seemed to be attenuated by gender confirmation surgery.

Another cross-sectional study by Tebbe *et al.*,³⁴ including 335 US individuals identifying with a trans identity came to similar results. The CES-D scale was used to assess depressive symptoms. The study showed that depression scores were higher than those in the general population. In addition, social support, through the mediating role of depression, emerged to be a protective factor for suicide risk. Some studies tried to further investigate factors contributing to suicidal ideation. Perez-Brumer *et al.*³⁵ presented a secondary analysis of cross-sectional Internet-based health assessment on 1229 US transgender adults: higher levels of internalized transphobia were significantly associated with increased odds of lifetime suicide attempts (aOR 1.18, 95% CI 1.04-1.33). Furthermore, lower levels of structural stigma were found to be significantly associated with fewer lifetime suicide attempts. Across transgender individuals, a higher proportion of female-to-male (FtM) transgender participants attempted suicide in their lifetime compared to male-to-female (MtF) transgender

TABLE II.—*Characteristics of papers focusing on minority stress and depression included in the review.*¹³⁻³²

Authors	Sample	Study design	Outcomes related to depression
Baams <i>et al.</i> ²⁸	N.=876 individuals, age 15-21, living in the US 30.7% gay men, 21.8% lesbian women, 15.5% bisexual men and 31.9% bisexual women.	Longitudinal Panel Study on suicide in LGBT youth, data from the first wave analysis.	“Perceived burdensomeness” mediates the impact of experienced victimization on depression and suicidal ideation for both gay and bisexual men and lesbian and bisexual women. Coming-out related stress mediates the association only for girls.
Bränström <i>et al.</i> ¹³	N.=30730 individuals from the Stockholm Public Health Cohort	Longitudinal population-based study	Gay and Lesbian individuals were more likely to receive treatment for anxiety disorder (AOR=3.80; 95%CI=2.54-5.69) and to use antidepressant medication (AOR=2.13; 95%CI=1.62-2.79); bisexual individuals were more likely to receive treatment for mood disorder (AOR=1.58; 95%CI=1.00-2.48), anxiety disorders (AOR=3.23; 95%CI=2.22-4.72) and substance use disorders, and to use antidepressant medication (AOR=1.91 95%; CI=1.12-3.25) when compared with heterosexuals.
Bruce <i>et al.</i> ³⁰	N=200 young men, age 16-24, living in Chicago. 62% gay men, 28.5% bisexual men, small percentages of “queer”, “trade”, “other”.	Cross-sectional	Buffering effect of friendship networks, rather than parental support, on depressive symptoms in gay male youth. Positive association of concealment stress during adolescence on positive identity development.
Cerdà <i>et al.</i> ²²	N.=1126 of MSM (men who have sex with men), living in New York City.	Cross-sectional	Archival and survey-based data were obtained on neighborhoods where the participants lived and where they socialized more often. Among urban MSM, the places where they socialize, rather than those they inhabit, have a particular influence on anxiety and potentially their levels of depression.
Everett <i>et al.</i> ³²	N.=517 lesbian, age 18 or older, living in the Chicago Metropolitan Area	Longitudinal study; Third wave of data of the “Health and Life Experience of Women Study”	Civil union legislation was associated with lower levels of stigma consciousness, perceived discrimination, depressive symptoms and one indicator of hazardous drinking (adverse drinking consequences) for all sexual minority women.
Feinstein <i>et al.</i> ²¹	N.=414 individuals, age 18-67 (199 lesbians and 215 gay men) recruited <i>via</i> online surveys.	Cross-sectional	Parental acceptance moderates the association between depression and proximal minority stress stressors (internalized homonegativity and rejection sensitivity) It did not moderate the association with more distal minority stress factors (experienced discrimination) This pattern did not replicate with general family support as a moderator.
Hoy-Ellis <i>et al.</i> ¹⁷ (Aging and Mental Health 2016)	N=2349 lesbian, gay and bisexual aged 50 and older living in the US	Cross-sectional	Disclosure of sexual orientation is indirectly associated with chronic physical health condition and depression, mediated by internalized heterosexism with a suppressor effect.
Hoy-Ellis <i>et al.</i> ²⁶	N.=174 transgender adults, age 50-9, living in the US	Cross-sectional Secondary analyses of cross-sectional data from the Caring & Aging with Pride over Time	Nearly half (48%) of participants have clinically significant depressive symptomatology. Perceived general stress mediates the relationship between internalized heterosexism and depression (general stress and minority stress operate in tandem on depression). Identity disclosure has a significant inverse relationship with internalized heterosexism.
Lambe <i>et al.</i> ²⁰	N.=203 bisexual women living in the US	Cross-sectional	Perceived binegative discrimination and internalized binegativity were significantly correlated with self-esteem and depression; yet, only internalized binegativity predicted self-esteem and depression. Frequent participation to a bisexual-specific community (1-3 times per week) reduced the impact of internalized binegativity on depression but not self-esteem.

(To be continued)

TABLE II.—*Characteristics of papers focusing on minority stress and depression included in the review*¹³⁻³² (continues).

Authors	Sample	Study design	Outcomes related to depression
La Roi <i>et al.</i> ²⁹	N.=1738 Dutch young respondents, age range 11-22 years. 151 self-identified as LGB	Retrospective (Five waves of data from a longitudinal cohort study)	Lesbian girls and bisexuals (mostly girls in the sample) are at increased risk of depressive symptoms already at age 11. Self-reported peer victimization mediates the association between sexual orientation and depression both for boys and girls, whereas parental rejection is a mediation factor only for girls/bisexuals.
Lindquist <i>et al.</i> ³¹	N.=297 LGBT young adults, age of 18 and 22, recruited <i>via</i> online surveys.	Cross-sectional with retrospective data for self-report trauma	High school and current community support, childhood trauma, victimization and negative attributional style are significant predictors of the depressive symptoms found in this sample. In particular, global attributions are the most predictive.
Marsack <i>et al.</i> ²⁴	N.=771 participants specifically from rural areas across the US. 83% of sample self-identified as gay, lesbian, bisexuals and “other” sexual identities.	Cross-sectional	Three scale of stigma were used (internalized, enacted, anticipated); all were associated with increased depression scores (enacted and anticipated stigma with the highest possible score and highest mean score). Individuals who self-identify as “bisexual” or “queer” have higher mean stigma and depression scores than gay/lesbians.
McCarthy <i>et al.</i> ²³	N.=770 participants from Nebraska (USA). 75,3% self-identified as homosexual/gay/lesbian, 11,9% transgender and gender non-conforming participants	Cross-sectional	Predictors of depressive symptoms (measured by CES-D): -self-acceptance/ being married-partnered; being older (protective factors) -being female, perceived discrimination (risk factors)
Molina <i>et al.</i> ¹⁸	N.=470 self-identified bisexual women living in the US and participating in an online survey.	Cross-sectional	Sample stratified by partner number/gender: -women with a single male partner and women with multiple female and male partners are particularly keen to depression and alcohol compared with women with single female partners. These differences are mediated by experienced bi-negativity.
Nuttbrock <i>et al.</i> ²⁵	N.=230 transgender women age 19-59 living in the New York City Metropolitan area.	3-years prospective study	Significant association of psychological and physical gender abuse with major depression during follow-up. The longitudinal lagged associations of both types of abuse with depression were 60% and 45% less, respectively. These data suggest that transgender women partially adapt emotionally to gender abuse with the passage of time.
Pakula <i>et al.</i> ¹⁹	N.=222,548 Canadians age 18-59 who self-identified as lesbian, gay, bisexual or heterosexual. Data pooled from a large, national, multi-year sample	Cross-sectional survey	Sexual minority respondents reported higher rates in all mental health outcomes (anxiety disorder, mood disorder, mood and anxiety disorder, mood or anxiety and heavy drinking), when compared to heterosexuals. Bisexual respondents reported the highest rates.
Parra <i>et al.</i> ¹⁴	N.= 62 age 17-27 from Montréal, Quebec. 27 lesbian and bisexual young women and 35 gay and bisexual young men.	Cross-sectional	LGB-related stress and depression, diurnal cortisol slopes and Internalized Homonegativity were positively associated with depression. Mediation analyses showed that diurnal cortisol slopes mediate the link between LGB-related stress and depression.
Pflum <i>et al.</i> ²⁷	N.=865 TGNC adults aged 18 or older (N.=427 TFS and N.=438 TMS) residents in US or Canada and participating in an online survey	Cross-sectional online survey	For both TMS and TFS participants, general social support was negatively associated with symptoms of anxiety and depression. The negative correlation between trans community connectedness and mental health symptoms was significant only for TFS participants.

(To be continued)

TABLE II.—*Characteristics of papers focusing on minority stress and depression included in the review*¹³⁻³² (continues).

Authors	Sample	Study design	Outcomes related to depression
Pyra <i>et al.</i> ¹⁵	N.=1811 Women with or at risk of HIV, enrolled from the Women's Interagency HIV Study (WIHS) from 1994 to 2013 in various areas of the US.	Retrospective study Longitudinal data	In separate analyses, bisexual women and women who reported having sex with both men and women during follow-up had higher unadjusted odds of depressive symptoms, compared with heterosexuals and women who reported only having male sexual partners. Pattern of depressive symptoms over the life course was different for sexual minority women, who have increased odds in early adulthood, but lower at midlife (after age 55)
Wight <i>et al.</i> ¹⁶	N.=312 gay men age 48-78 participating in the Multicenter AIDS Cohort Study (MACS) since 1984-85 in the US	Cross-sectional survey	"Internalized gay ageism" can be reliably measured among this sample, and is positively associated with depression. One's sense of "mattering" mediates but not moderates this association.

LGBT: lesbian, gay, bisexual and transgender; MSM: men who have sex with men; TGNC: transgender and gender nonconforming; TFS: trans female spectrum; TMS: trans-male spectrum.

individuals. Suicidal ideation and its predictors were also the main focus of a community-based study conducted in Virginia over a 1-year period, recruiting 350 adult participants identifying as transgender.³⁶ The authors, Rood *et al.*, suggested that suicidal ideation was significantly more common across individuals who experienced violence or discrimination, namely: people who experienced physical or sexual violence (aOR: 4.18, 95% CI 2.25-7.76, $P<0.001$), people who experienced both types of violence (aOR: 5.44, 95% CI 2.41-12.30, $P<0.001$), and people who experienced at least one type of gender-related discrimination (aOR: 2.09, 95% CI: 1.09-4.01, $P<0.05$). In addition, individuals planning to transition were also significantly more likely to report lifetime suicidal ideation than those with no plans to transition (aOR 2.85, 95% CI 1.42-5.72, $P<0.01$). Consistent with other studies, FtM transgender participants experienced higher levels of lifetime suicidal ideation compared to MtF transgender counterparts. Another American cross-sectional study³⁷ which included 237 trans individuals aged 18-44 proved a significant correlation between external harassment and internal psychological burden. In particular, a statistically relevant correlation was found between distal trans stress (*i.e.*, being verbally or physically harassed because of gender identity) and internalized transnegativity (*i.e.*, internalization of negative societal attitudes about one's trans identity). Interestingly, the "experience of transgender discrimination scale" (ETD), which

was also chosen by Staples *et al.*³⁷ to assess distal trans stress, specifically considers discrimination in accessing health care services.

In agreement with previous data, a cross-sectional study by Trujillo *et al.*³⁸ involving 78 transgender participants reported a correlation between harassment and mental health problems like depression and eventually suicidal ideation.

Testa *et al.*³⁹ considered a wider range of stressors in a cross-sectional study that included 816 transgender or gender non-conforming individuals. A significant correlation between suicidal ideation and some stressors was identified, such as: internalized transphobia, negative expectations, thwarted belongingness, and perceived burdensomeness. Notably, as other studies have shown, this also found that FtM transgender individuals scored significantly higher than other groups on discrimination. For example, Scandurra *et al.*^{40, 41} support internalized transphobia as an important predictor of mental health variables (anxiety, depression and suicidal ideation), and point out that everyday discrimination and shame significantly increase the odds of suicide ideation by almost two times.

Investigating minority stress across homosexual young people was the main aim in an Australian cross-sectional study conducted in 2010 by Lea *et al.*,⁴² who enrolled 572 young adults aged 18-25 years. The findings supported the minority stress theory proposition that chronic social stress due to sexual identity was associated with poor mental health outcomes. In particular, uni-

variate and multivariable analyses highlighted significant positive associations between internalized homophobia and psychological distress and suicidal thoughts. Perceived stigma and homophobic physical abuse were also associated to attempted suicide. Results from the “Youth Risk Behavior Surveys” presented by Stone *et al.*⁴³ also highlighted that young individuals having sexual contacts with people of both sexes have the greatest prevalence of suicide risk across the LGBT population.

Bisexual individuals were also the main focus of a cross-sectional study⁴⁴ that included 503 participants aged 18-64. The authors investigated the effects of distal stressors such as anti-bisexual prejudice, and proximal stressors such as internalized heterosexism and identity concealment. The collected data proved a correlation between both distal ($\beta=0.25$, $P<0.001$) and proximal stressors ($\beta=0.36$, $P<0.001$) and loneliness. Loneliness was then strongly associated with high levels of psychological distress ($\beta=0.67$, $P<0.001$) and suicidality ($\beta=0.49$, $P<0.001$).

One study specifically focused on 16,977 sexually active male teenagers who took part in the “Youth Risk Behavior Surveillance System” surveys conducted in 2005 and 2007 in 11 US jurisdictions by Mustanski *et al.*⁴⁵ A syndemic of psychosocial health issues was assessed, including: subjective feeling of sadness, drugs use, risky sex, violence and harassment, and suicide attempt. Prevalence rates of the victimization and syndemic variables were higher among gay and even more among bisexual teenagers, and experiences of victimization were more associated with serious suicide attempts in youths occupying a sexual minority position. Michaels *et al.*⁴⁶ specifically investigated suicidal ideation in a sample of 167 gay men. The study showed that harassment or discrimination appeared to be significantly related to internalized homophobia ($\beta=0.25$, $P<0.05$) and depressive symptoms ($\beta=0.28$, $P<0.001$). Depressive symptoms were then positively correlated to suicidal ideation ($\beta=0.67$, $P<0.001$). Furthermore, an indirect relationship was found for the degree to which an individual is out about his sexual orientation (outness), which negatively correlated to suicidal ideation, as mediated by depressive symp-

toms ($\beta=0.08$, 95% CI: 0.20-0.002). Velkoff *et al.*⁴⁷ tested suicide risk in a sample of 51 sexual minority women, and a correlation between both failed belongingness and perceived burdensomeness and past suicide attempts was found ($\beta=0.01$, $P=0.02$).

A German cross-sectional study by Plöderl *et al.*⁴⁸ tried to compare items and factors related to suicide ideation across 438 adults, of which 255 belonged to a sexual minority. Results showed that suicide ideation correlated to depression, hopelessness, burdensomeness, failed belongingness, and poor social support.

Suicidality among sexual minorities was also studied by focusing on relevant personality traits. Livingston *et al.*⁴⁹ recruited 412 sexual minority adults aged 18-25 and explored a list of adaptive traits, including lower neuroticism and higher extroversion, agreeableness, conscientiousness, and openness. Participants with an adaptive personality profile were less likely to report a previous suicide attempt (OR: 0.62; 95% CI: 0.40-0.97). Moreover, psychological distress was found to be inversely related with extraversion, explaining an increased risk of alcohol misuse, social withdrawal, and fears of being negatively evaluated by others. Also on the role of substance use on suicidality, in a cross-sectional study by Mereish *et al.*⁸² on 1457 LGBT individuals aged 19-70, substance misuse was found to partially mediate the relationship between LGBT-based victimization and suicidal ideation ($t=6.07$, $P<0.001$) and between LGBT-based victimization and suicide attempts ($t=6.84$, $P<0.001$).

A systemic review and meta-analysis by Hottes *et al.*⁸³ collected 30 cross-sectional studies published until 2014, carried out in the US, Canada, Europe, Australia, and New Zealand. The review confirmed high suicide risk among LGBT individuals, namely bisexual individuals. It also helped to highlight some limitations that commonly affect cross-sectional studies on sexual minority. Observing that community-based surveys (recruiting sexual minorities through LGBT venues) resulted in a pooled estimate of 20% (95% CI: 18-22%) of attempted suicide, whereas in general population surveys the proportion was 11% (95% CI: 8-15%), the authors

suggested that general population surveys may include a higher proportion of individuals who are reluctant to report a sexual minority identity and who, also because of this, might be more inclined to attempt suicide. This is consistent with the finding that the pre-coming out phase has the highest risk for self-harm behaviors. It also supports the concept that sexual minority health is largely context-dependent and may benefit from institutional policies and socio-cultural changes (Table III).

Substance use

Epidemiological studies regarding substances use in the adult population have found that the lifetime prevalence of substance use disorders is around 3%, and the global prevalence of alcohol use disorder is between 3% to 16%.⁸⁴ LGBT individuals have higher rates of alcohol consumption and substance abuse. Specifically, individuals in a minority position are twice as likely to meet criteria for substance-related disorders.⁸⁰ The minority stress theory^{3, 4} is widely used as a framework to understand and explain the underlying mechanisms of substance use among LGBT populations. Psychological distress associated with sexual minority stressors, including sexual minority negative life events, has been shown to affect the mental health outcome of sexual minorities through the development of negative coping skills such as problematic alcohol use. LGBT individuals use alcohol and other drugs more than heterosexual people.⁵⁰ The higher risk of alcohol use, cannabis use, and daily tobacco smoking among LGBT populations was strongly associated to psychological distress, experiences of discrimination, victimization, and social isolation. Two other cross-sectional studies investigated both the prevalence and mechanisms of minority stressors. The first, by Livingston *et al.*,⁵¹ was an online survey recruiting 704 sexual minority adults from LGBT organizations and hypothesized that psychological distress mediates the relationship between distal stressors and alcohol misuse, but that personality trait differences could moderate the final outcome. Extraversion and conscientiousness were strongly associated with substance misuse. The second study by Slater *et al.*⁵² aimed at assessing

the relationship between experienced discrimination and excessive alcohol and substance use among a sample of 1351 LGBT individuals. Sexual orientation-based discrimination was associated with greater odds of substance and alcohol related outcomes, but the association was even stronger among bisexuals, Hispanics, and less-educated sexual minority adults, suggesting the contribution of gender, ethnicity, and education as mediators of psycho-social vulnerability.

This idea, which tends to be neglected by general cross-sectional studies, was further explored in three more studies. The concept of “triple jeopardy of marginalization” is explained in the pilot study by Craig *et al.*,⁵³ where female gender, ethnic minority status, and sexual minority position were simultaneously experienced by the sample of multiethnic lesbian and bisexual adolescent females. Their findings support a strong correlation between increased stigmatization and a three-fold increase of substance abuse. History of sexual abuse, academic difficulties, and increased experienced stress were also significant determinants of self-reported poor mental health. The work by Matthews *et al.*⁵⁴ examined the influence of acculturation and discrimination on substance use among Latino LGBTQ women living in the Chicago area. Again, belonging to more than one marginalized group was found to enhance negative health outcomes due to the use of illicit drugs and alcohol. Nevertheless, higher acculturation and adaptation to the dominant culture were also directly associated with increased discrimination and alcohol and substance misuse. Finally, Gilbert *et al.*⁵⁵ examined the relationship of experiencing social stress with alcohol use among gay and bisexual Latinos living in North Carolina (N.=190). They suggested that social support may mediate the relationship between ethnic discrimination and heavy episodic drinking. Low social support was positively associated with coping drinking behaviors. However, in agreement with the study by Matthews *et al.*,⁵⁴ English as a first language positively correlated with heavy drinking behaviors. In this study, contrary to expectations, discrimination linked with sexual minority position was not associated with drinking-related health outcomes.

LGBT youth may be a specific subgroup ex-

TABLE III.—*Characteristics of papers focusing on minority stress and suicidality included in the review.*³³⁻⁴⁹

Authors	Sample	Study design	Outcomes related to suicidality
Bailey <i>et al.</i> ³³	N.=889, non-random sample obtained <i>via</i> a range of United Kingdom-based support organizations and services	Narrative analysis	35% of the overall sample had attempted suicide at least once and 25% had attempted suicide more than once
Lea <i>et al.</i> ⁴²	N.=572 young adults, age 18-25 years, who identified as homosexual living in Sydney	Cross-sectional	Significant positive associations between internalized homophobia and psychological distress (OR=1.4; 95% CI=1.1-1.7) and suicidal thoughts (OR=1.6; 95%CI=1.3-2.1), and between perceived stigma and psychological distress (OR=2.2; 95%CI=1.6-3.0), suicidal thoughts (OR=1.7; 95%CI= 1.2-2.5), and attempted suicide (OR=1.8; 95%CI=1.3-2.5). Significant positive associations between homophobic physical abuse and psychological distress (OR=1.7; 95%CI=1.1-2.7), suicidal thoughts (OR= 2.2; 95%CI=1.3-3.6) and attempted suicide (OR=3.8; 95%CI=2.4-6.0).
Livingston <i>et al.</i> ⁴⁹	N.=412 participants, age 18-25, residing in the United States, drawn from a dataset of sexual and gender minorities individuals.	Cross-sectional	The relationship between distal distress and alcohol misuse was significant for “at risk personality profile” (Coeff.=0.082; P<0.001), but not for “adaptive personality profile” individuals (Coeff.=0.018 P=0.336). Individuals with an adaptive personality profile were less likely to report a previous suicide attempt (OR=0.62; 95%CI=0.40-0.97).
Mereish <i>et al.</i> ⁸²	N.=1457 individuals, age 19-70. The sample had a total of 305 sexual minority women, 1130 sexual minority men, and 16 transgender living in New England City, USA	Cross-sectional	A relationship between LGBT-based victimization and suicidal ideation (t=6.07; P<0.001) and another between LGBT-based victimization and suicide attempts (t=6.84; P<0.001) were found. Substance use seemed to partially mediate these relationships.
Mereish <i>et al.</i> ⁴⁴	N.=503 adults, age 18-64, participating in an online international survey, who identified as cisgender women (76.5%), cisgender men (11.3%), and transgender/gender non-binary (12.1%).	Cross-sectional	Loneliness was associated with both distal (Coeff.=0.25; P< 0.001) and proximal (Coeff.=0.36; P<0.001) stressors. Loneliness was also associated with more psychological distress (Coeff.=0.67; P<0.001) and suicidality (Coeff.=0.49; P<0.001).
Michaels <i>et al.</i> ⁴⁶	N.=167 gay men, age 22-78. 80% identified as exclusively homosexual (N.=134), 19% identified as mostly homosexual (N.=32), and 1% self-identified as Other (N.=1). The participants were recruited in the US <i>via</i> LGBT social-networks and participated in an online survey	Cross-sectional	Harassment or discrimination significantly related to internalized homophobia (Coeff.=0.25; P<0.05) and depressive symptoms (Coeff.=0.28; P<0.001). Depressive symptoms were then positively correlated to suicidal ideation (Coeff.=0.67; P<0.001). Outness negatively correlated to suicidal ideation, as mediated by depressive symptoms (Coeff.=0.08; 95%CI=0.20-0.002)
Mustansky <i>et al.</i> ⁴⁵	N.=16977 men, aged 13-18; 4.0% (N.=608) MSM, 3.2% (N.=577) MSMW, participating in an online US national survey.	Cross-sectional	Experiences of victimization were more associated to serious suicide attempts among MSM (OR= 5.75; 95%CI=1.36-24.39) and MSMW (OR=5.08; 95%CI=2.14-12.28) than among MSW (OR=3.47; 95%CI= 2.50-4.83).

(To be continued)

TABLE III.—*Characteristics of papers focusing on minority stress and suicidality included in the review (continues).*

Authors	Sample	Study design	Outcomes related to suicidality
Perez-Brumer <i>et al.</i> ³⁵ (Behavioral Medicine, 2015)	N.= 1229 transgender individuals living in the US	Cross-sectional	Higher levels of internalized transphobia were associated with suicide attempts (aOR=1.18, 95%CI= 1.04-1.33). Lower levels of structural stigma were associated with fewer lifetime suicide attempts (aOR= 0.96, 95%CI= 0.92-0.997).
Plöderl <i>et al.</i> ⁴⁸	N.=408 individuals from Bavaria. 255 adult sexual minority and 183 heterosexual participants	Cross-sectional	Suicide ideation was associated with depression, hopelessness burdensomeness, failed belongingness and low social support.
Rood <i>et al.</i> ³⁶	N.=350 adults transgender individuals from Virginia (US)	Cross-sectional	Physical and sexual violence correlated to suicidal ideation (aOR=5.44, P<0.001). Trans-related discrimination was associated with suicidal ideation (aOR=2.09, P<0.05). Planning to transition correlated to lifetime suicidal ideation (aOR=2.85, P<0.01)
Scandurra <i>et al.</i> ⁴⁰	N.=149 Italian Transgender TGNC individuals, age 18-63. 75 MtF, 74 FtM participating in the “Trans Life online Survey”	Cross-sectional	Depression was assessed through CES-D. 65.3% MtF and 60.8% FtM TGNC individuals met the clinical cut off point for high depressive symptoms. Everyday discrimination and shame significantly increased the odds of ideating suicide by almost two times.
Staples <i>et al.</i> ³⁷	N.=237 transgender participants, age 18-44, living in the US	Cross-sectional	Distal trans stress was related to internalized transnegativity (OR=0.27; P<0.01)
Stone <i>et al.</i> ⁴³	N.=42343 individuals from the “Local Youth Risk Behavior Survey Sites” US 2001-2009	Cross-sectional	Individuals having both-sex contacts had the greatest prevalence of Suicide Risk Outcomes: 7.8% medically serious attempts and 38.7% suicidal ideation
Tebbe <i>et al.</i> ³⁴	N.=335 individuals identifying with a trans identity participating in a online survey and residing in the United States	Cross-sectional	Internalised antitrans attitude (Coeff.=0.17; P< 0.01), drug use (Coeff.=0.21; P<0.01) and depression (Coeff.=0.50; P<0.01) were all associated with suicide risk
Testa <i>et al.</i> ³⁹	N.=816 transgender or gender nonconforming individuals living in the US or Canada and participating in an online survey	Cross-sectional	Internalized transphobia (Coeff.=0.23; P<0.001) and negative expectations (Coeff.=0.20; P<0.001) were positively associated with suicidal ideation. Thwarted belongingness (Coeff.=0.08; P< 0.001) and perceived burdensomeness (Coeff.=0.33; P<0.001) were also significant predictors of suicidal ideation
Trujillo <i>et al.</i> ³⁸	N.=78 transgender participants: 26 trans men (33.3%), 29 trans women (37.2%), and 23 (29.5%) persons who identified as other gender. Participants were recruited <i>via</i> email for a national US online survey	Cross-sectional	Harassment/rejection was positively related to mental health problems (Coeff.=0.47; P=0.001). The direct paths from harassment/rejection to depression (Coeff.=0.46; P<0.001) and from depression to past suicidal ideation (Coeff.=0.54; P<0.001) were also statistically significant, as well as the indirect effect of harassment/rejection on past suicidal ideation through depression was also statistically significant (Coeff.=0.25; 95%CI= 0.12-0.44)
Velkoff <i>et al.</i> ⁴⁷	N.=51 sexual minority women participating in an online survey	Cross-sectional	Significant correlation between perceived burdensomeness and failed belongingness on previous suicide attempts, (Coeff.=0.01; P=0.02)

CES-D: Center for Epidemiologic Studies Depression Scale; LGBT: lesbian, gay, bisexual and transgender, FtM: female to male; MtF: male to female; TGNC: transgender and gender non conforming; MSW: men who have sex with women; MSM: men who have sex with men; MSMW: men who have sex with men and women.

periencing stigma-related stressors leading to increased alcohol and other drugs (AOD) use/abuse. Kelly *et al.*⁵⁶ explored young people's perceptions of AOD use within the LGBT community, and the impact of homophobia on AOD use. The sample was composed of 161 young LGBT individuals aged 13-24 years who attended an LGBT festival in Brisbane, Australia. The assessment was carried out by means of the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) and the Fagerström Test for Nicotine Dependence and Drug Check Assessment Tool, modified with new items regarding perceptions of AOD use and homophobia. The prevalence of AOD was higher among LGBT individuals than the general Australian youth population. Additionally, perceived discrimination due to sexual orientation was associated with AOD use. The group identified as gender-diverse (transgender or gender queer) resulted with the highest rate of alcohol, tobacco, and illicit substance misuse, and they were the most vulnerable for poly-substance abuse. Another Australian study by Wilson *et al.*⁵⁷ assessed that in their sample of 250 disadvantaged young drug users, individuals covering a sexual minority position were more likely to have ever been diagnosed with a mental illness and have used injected drugs compared with heterosexual counterparts. Similar results are reported in the paper of Kuyper *et al.*⁵⁸ Data collected through an online survey completed by 528 Dutch young adults aged 16-25 years old showed that mostly (but not exclusively) heterosexual individuals reported higher levels of psychological distress, suicidality, and drug and tobacco use than lesbian/gay participants. For the most part, heterosexual individuals also showed fewer protective factors such as openness about sexual orientation, community involvement, and strong LGB network. In a longitudinal study involving 13519 American adolescents, Kecojevic *et al.*⁵⁹ found that sexual minorities, especially younger females, reported between 60% to more than two times higher risk for poly-substance use compared with completely heterosexual peers of the same gender.

Further research particularly focused on academic populations, which are often targets of prevention programs. Kerr *et al.*⁶⁰ compared

AOD use (including tobacco) among lesbian, bisexual, and heterosexual undergraduate women attending college. Bisexual women had the greatest odds of using alcohol, tobacco, marijuana, illicit drugs, and misusing prescription drugs compared to the other two groups. Similar results are reported by Shadick *et al.*,⁶¹ who examined the differences between heterosexual and LGBTQ students with respect to the nonmedical use of medications. Bisexual and questioning male students reported higher rates of nonmedical use of medications compared to heterosexual and gay students, but rates were highest among lesbian, bisexual, and questioning females, particularly for painkillers. Bisexual students of both sexes reported the highest nonmedical use for stimulants and anxiolytics. Veliz *et al.*⁶² explored AOD in the previous month on a population of collegiate athletes in a sexual minority position. Sexual minority subjects were found to be at greater odds to use cigarettes, alcohol, and marijuana. Furthermore, when compared with heterosexual counterparts, LGBTQ students had greater odds for being diagnosed or treated for a substance use disorder during the previous 12 months. Finally, Newcomb *et al.*⁶³ evaluated drug use differences between sexual minority and heterosexual students, including interactions with gender and ethnicity. They found increased odds of methamphetamine, heroin, and MDMA misuse among bisexual individuals, whereas African American individuals and students with unsure sexual orientation identity had increased odds of cocaine, heroin, and MDMA use.

Other studies focused on older LGBT populations. The one by Bryan *et al.*⁶⁴ reported that 21% of LGB older adults exhibited high-risk drinking, irrespective of gender. Heavy drinking behaviors were more frequent among men who reported daily experiences of discrimination and women who experienced low gender-specific social support. This suggests that older LGB men and women may adopt different coping strategies to face minority stressors. The second study, by Kuerbis *et al.*,⁶⁵ studied if drinking to cope with stress, loneliness, and gay community participation mediated the relationship between internalized heterosexism and behavioral health outcomes. Internalized heterosexism, described

as a proximal minority stressor by Meyer, was significantly correlated with heavy drinking behavior and psychological distress, especially in the older LGBT population.

A convenience sample of only male participants is the common factor of three studies included in this review, showing similar findings regarding alcohol and substance use. Lea *et al.*⁶⁶ assessed alcohol use *via* AUDIT-C in the previous 12 months among a community-based sample of gay men in Sydney. They found that gay men should be a priority target population for alcohol-related prevention programs, especially among lower age groups. Petersson *et al.*⁶⁷ explored the use of “club drugs” (*i.e.*, MDMA, cocaine, ketamine, “crystal meth”) among a sample of Swedish gay men. Use of these substances was particularly prevalent among younger subjects from metropolitan areas, and among men diagnosed with HIV or other sexually-transmitted infections. Of special interest is also the cross-sectional study by O’Cleirigh *et al.*⁶⁸ that correlated both trauma history and sexual minority identity to higher tobacco use among gay and bisexual men.

Lesbian and bisexual women were the convenience sample of four more papers supporting the specific role of gender. Lewis *et al.*⁶⁹ use Meyer’s⁴ and Hatzenbuehler’s⁷ conceptualizations of minority stress to examine the associations between ethnicity, socioeconomic status, and minority processes in 867 lesbian women participating in an online survey. In line with the literature, they find that with the additive influence of ethnicity and socioeconomic status, distal minority stressors (*i.e.*, perceived sexual minority discrimination) were associated with group-specific processes (proximal sexual minority stress, concealment, lack of connection to the lesbian community) and psychological processes (rumination and social isolation) finally associated with negative mental health outcomes such as maladaptive coping and hazardous drinking behavior. Kelley *et al.*⁷⁰ addressed the association between relationship adjustment and alcohol misuse among lesbian women and their same-sex intimate partners, after controlling for verbal and physical aggression. Wilson *et al.*⁷¹ focused on a population of young lesbian and bisexual

women, reporting that women with higher levels of minority stress were more likely to have worse drinking health outcomes. Lehavot *et al.*⁷² evaluated differences according to age in alcohol misuse across sexual orientation identity and sexual orientation behavior among 702 female veterans (36% lesbian/bisexual). Sexual minority women, whether categorized by self-identity or sexual behavior, were more likely to screen positive for alcohol misuse (higher scores at the AUDIT-C) than heterosexual women. Moreover, the prevalence and severity of alcohol misuse was higher among relatively younger self-identified lesbians compared to heterosexual women.

More studies were dedicated to AOD use among transgender individuals. Gonzalez *et al.*⁷³ assessed and analyzed the correlation between AOD use and demographics, sexual orientation, gender characteristics, and gender minority stress among 1210 U.S. transgender adults. Overall, 21.5% of participants reported alcohol abuse, 24.4% cannabis use, and 11.6% other drug use. They found a significant association of gender dysphoria with alcohol and substance use, only partially explained by gender minority stressors as enacted, social, and internalized stigma. Reisner *et al.*⁷⁴ reported an association between enacted stigma (being previously refused by a health provider) and anticipated stigma (avoiding healthcare settings and delaying needed medical care) and self-reported substance use as a coping strategy.

Limitations of the study

Some limitations affecting the present study need to be acknowledged. First, the adopted criteria were not standardized, but rather were selected by the authors for recency and relevance of topic. In particular, we restricted our search between 1 January 2014 and 30 June 2018. Because of this, we may have missed relevant papers published before or after such time limits, as well as other types of articles (*e.g.*, case reports, case-series, or papers published in languages other than English) that might have provided useful information. Despite this, a noticeable amount of studies were available in such a short period of time, thus confirming the growing research in the topic addressed. This limitation also applies to the choice

TABLE IV.—*Characteristics of papers focusing on minority stress and substance use included in the review.*⁵⁰⁻⁷⁴

Authors	Sample	Study design	Outcomes related to substance use
Bränström <i>et al.</i> ⁵⁰	N.=79,568 individuals participating in the Swedish National Public Health Survey (N.=1673 self-identified as lesbian, gay or bisexual)	Cross-sectional	Significantly elevated prevalence of high-risk alcohol use, cannabis use and daily tobacco smoking among sexual minorities than among heterosexuals. The elevated risk of co-occurring psychological distress was higher among gay (AOR 2.65; 95%CI= 1.98-3.55) and bisexual women (AOR=3.01; 96%CI=2.43=3.72).
Bryan <i>et al.</i> ⁶⁴	N.=2,351 LGB adults aged 50-98, living in the US	Cross-sectional	Approximately one fifth (20.6%) of LGB older adults reported high-risk drinking, with non-significantly different rates between men (22.4%) and women (18.4%).
Craig <i>et al.</i> ⁵³	N.=116 multiethnic lesbian and bisexual adolescent females living in a southeastern urban city of US	Cross-sectional	Being Hispanic had a positive correlation with a lack of family acceptance (0.202) and substance abuse issues (0.298), while being African-American was negatively correlated with substance abuse issues (-0.398) at the P<.01 level. Being bisexual had a negative correlation with stress related risks (-0.214) at the P<0.05 significance level.
Gilbert <i>et al.</i> ⁵⁵	N.=190 immigrant sexual and gender minority Latinos in North Carolina	Cross-sectional	Approximately half of participants (53%) reported no alcohol consumption in the past year. Among current drinkers (N.=90), the most frequently endorsed reasons for drinking included boredom/for fun (42%), an undefined reason (29%), and to enhance sex (14%).
Gonzalez <i>et al.</i> ⁷³	N.=1210 Transgender adults living in the US participating in an online survey.	Cross sectional	21.5% of participants reported excessive alcohol use. Cannabis use was 24.4%; illicit drug (non-cannabis) use was 11.6%. Multivariable analyses suggested that gender dysphoria was significantly associated with substance use.
Kelley <i>et al.</i> ⁷⁰	N.=819 Lesbian women, age 18-35, recruited online	Cross-sectional	Partners' alcohol use was moderately correlated with physical aggression. Discrepancy in alcohol use was associated with poorer relationship adjustment after controlling for psychological aggression and physical aggression.
Kelly <i>et al.</i> ⁵⁶	N.=161 LGBT young people, age 13-14, who attended a LGBT festival in Brisbane, Australia, in 2012	Cross-sectional	The 84% of responders reported recent use of alcohol. Of these, 85% met AUDIT-C criteria for hazardous alcohol use. 57% of responders reported the recent use of an illicit substance, with 30% reporting the use of two or more substances. There were no significant findings for prevalence rates between sexual identity (LGB) and alcohol or other drugs use.
Kecojevic <i>et al.</i> ⁵⁹	N.=13,519 US adolescents, age 12-29, living in the US from the Growing Up Today Study (N.=16,873)	Longitudinal Study	Compared with their same-gender CH peers, sexual minorities had higher risk for concurrent polysubstance use over all repeated measures (RRs for sexual minority subgroups: 1.63-2.91, P<0.001), and for all age groups (RRs: 1.50-4.04, P<0.05-<0.001), except GL males aged 18-20 years.
Kerr <i>et al.</i> ⁶⁰	N.=42,986 American undergraduate college women (40,869 heterosexual, 538 lesbians, and 1579 bisexual)	Cross-sectional	Bisexual women had greater odds of using alcohol, tobacco, and marijuana than heterosexual women and lesbians. They also had greater odds of using all illicit drugs (except steroids) and misusing prescription drugs than heterosexual women and greater odds of using amphetamines other than meth, sedatives, and ecstasy when compared to lesbians. The study confirms increased ATOD use among sexual minority women as compared to their heterosexual counterparts with bisexual women having the highest use.

TABLE IV.—*Characteristics of papers focusing on minority stress and substance included in the review (continues).*

Authors	Sample	Study design	Outcomes related to substance use
Kuerbis <i>et al.</i> ⁶⁵	N.=198 MSM and met DSM-IV criteria for alcohol use disorder in the previous year, living in New York Tri State Area.	Cross-sectional and lagged mediation analyses Longitudinal test (9 months)	The total effect of internalized heterosexism on percentage of heavy drinking days was significant (Coeff.=0.004; P<0.05)
Kuyper <i>et al.</i> ⁵⁸	N.=580 LGB Dutch young adults age 16-25, N.=427 mostly heterosexual, N.=153 lesbian/gay.	Cross-sectional	Mostly heterosexual participants had higher scores on psychological distress, suicidality, and drug use than lesbian/gay participants.
Lea <i>et al.</i> ⁶⁶	N.=1546 gay men age>18 participant of the Sydney gay community.	Cross-sectional	9% of respondents were categorized as abstinent from alcohol, 33% as low-risk drinkers, 42% as moderate-risk drinkers and 16% as high-risk drinkers. In separate multivariate logistic regression analyses, high-risk drinking and reporting ≥4 adverse alcohol consequences were associated with younger age, being Australian-born, and having met men for sex at gay bars and dance parties.
Lehavot <i>et al.</i> ⁷²	N.=702 women veterans 36% lesbian/bisexual, living in the US and participating in an online survey	Cross-sectional	38% of women veterans screened positive for alcohol misuse. Lesbians and women who reported a history of having had sex with women reported greater prevalence of alcohol misuse and higher alcohol severity scores at younger ages but differences decreased with age.
Lewis <i>et al.</i> ⁶⁹	N.=867 young black and non-Hispanic white lesbian women age 18-35, participating in an online survey	Cross-sectional	Sexual minority discrimination was associated with hazardous drinking <i>via</i> the theoretically expected path of proximal minority stress, maladaptive coping, psychological distress, and drinking to cope. In addition, young adult women drink to cope not only with psychological distress (as expected) but also to manage other negative emotional experiences such as rumination/brooding and social isolation/loneliness.
Livingston <i>et al.</i> ⁵¹	N.=704 sexual minority adults was recruited US nationally from community organizations and social networking.	Cross-sectional	92.3% reported lifetime use of alcohol, 60.2% use of illicit drugs, and 59.7% alcohol and drug use; 7.4% reported never trying either drugs or alcohol. Bivariate correlations between each trait and alcohol use indicate that neuroticism and extraversion are positively associated, while conscientiousness is inversely associated with alcohol use. Openness was associated with drug but not alcohol use. Neuroticism was not a significant predictor of drug use at the P<0.05 level.
Matthews <i>et al.</i> ⁵⁴	N.=243 Latina lesbian, bisexual, transgender, queer, and questioning women living in the Chicago Metropolitan area	Cross-sectional	About 36% were current smokers and 18.5% of participants were heavy alcohol drinkers. In addition, over 70% of participants reported ever using marijuana.
Newcomb <i>et al.</i> ⁶³ (American Journal of Public Health, 2014)	N.=49.307 US sample students	Cross-sectional	Among, bisexual males reported the highest prevalence of use of all drugs except marijuana, for which gay male students reported the highest prevalence. Among female students, bisexuals reported the highest prevalence of marijuana, cocaine, and inhalant use, whereas lesbians reported the highest prevalence of methamphetamine and heroin use. Across genders, bisexual male students reported the highest prevalence of use of all drugs except marijuana, for which bisexual female students reported the highest prevalence.

(To be continued)

TABLE IV.—*Characteristics of papers focusing on minority stress and substance included in the review (continues).*

Authors	Sample	Study design	Outcomes related to substance use
O'Cleirigh <i>et al.</i> ⁶⁸	N.=3,103 Patients who received care at a clinic Massachusetts that focuses on serving sexual minorities.	Cross-sectional	In comparison to participants with no trauma history, those who reported 1, 2, 3, and 4 traumas had respectively the following OR of identifying as a current smoker: 1.70 (95% CI:1.24-2.34), 2.19 (95% CI:1.48-3.23), 2.88 (95%CI:1.71-4.85), and 6.94 (95% CI: 2.62-18.38). Adjusted logistic regressions revealed a significant dose effect of number of sexual minority stressors/traumas with odds of ever smoking.
Petersson <i>et al.</i> ⁶⁷	N.=3,004 MSM individuals in Sweden age 18 and older.	Cross-sectional	Club drug use exists in the Swedish MSM population and is particularly prevalent among gay identified, younger MSM from metropolitan areas, and among men with diagnosed HIV or other STIs. Moreover, club drug use was common among the men that had more sexual partners and took more sexual risks. These men were also more likely to have been diagnosed with an STI.
Reisner <i>et al.</i> ⁷⁴	N.=2578 FtM /trans masculine spectrum individuals living in the US (40% of the original NTDS sample)	Cross-sectional	More than one-quarter (28%) of the sample reported substance use to cope with healthcare mistreatment. The proportion of respondents who endorsed substance use as coping strategy was higher for those who reported enacted stigma, when compared with those who did not report it (40% vs. 26%, respectively; P<0.001).
Shadick <i>et al.</i> ⁶¹	N.=3451 first year American college students who self-identifies as heterosexual, lesbian, gay, bisexual or questioning.	Cross-sectional	When compared with heterosexual females, lesbian, bisexual and questioning females reported higher nonmedical use of prescription drugs and nonmedical painkiller use. For stimulants and anxiolytics, bisexual students reported the highest nonmedical use, followed by gay and lesbians students.
Slater <i>et al.</i> ⁵²	N.=1351 gay/lesbian, bisexual, or questioning adults from a US nationally representative survey.	Cross-sectional	Discrimination was associated with increased odds of the following: exceeding weekly drinking limits (aOR=1.52; 95%CI:1.12-2.08) among bisexuals, any substance use disorder (aOR=2.04; 95%CI:1.41-2.95) and nicotine use disorder (aOR=1.52; 95%CI: 1.08-2.14) among Hispanic sexual minorities, and exceeding weekly drinking limits (aOR=1.56; 95%CI:1.08-2.26) among those with a high school degree or less.
Veliz <i>et al.</i> ⁶²	N.=127,644 undergraduates assessment from the American College Health Association.	Cross-sectional	Sexual minority collegiate athletes had greater odds of past 30-day cigarette use, past 30-day alcohol use, past 30-day marijuana use, and indicating being diagnosed or treated for a substance use disorder during the past 12 months when compared to either heterosexual collegiate athletes or heterosexual non-athletes, but had similar odds on these outcomes when compared to sexual minority nonathletes. Additional analyses by gender reveal that male sexual minority athletes are at the greatest risk of being diagnosed or treated for a substance use disorder.
Wilson <i>et al.</i> ⁵⁷	N.=1057 individuals, age 18-25, living in the US, interviewed using online advertisements. Lesbian (40.5%) and bisexual (59.5%) women.	Longitudinal study	Minority stress was weakly correlated with typical drinking ($\rho=0.07$) and moderately correlated with drinking consequences ($\rho=0.16$). Over the 3 follow-up waves, the proportion of women reporting no drinking was similar compared to baseline (25.6%), but the likelihood of reporting no consequences increased (35.7%).

(To be continued)

TABLE IV.—*Characteristics of papers focusing on minority stress and substance included in the review (continues).*

Authors	Sample	Study design	Outcomes related to substance use
Wilson <i>et al.</i> ⁷¹	N.=250 young people, age 16-24, living in metropolitan area of Sydney.	Cross-sectional	In a sample of 250 young people, LGB or “other” participants more commonly reported ever injecting drugs (37.1% vs. 12.3%; 95%CI: 21.5-55.1 vs. 8.1-17.4%) or injecting drugs in the past 12 months (31.4% vs. 5.7%; 95%CI: 16.9-49.3 vs. 2.9-9.6%) compared with participants who identified as heterosexual.

LGB: lesbian, gay and bisexual; LGBT: lesbian, gay, bisexual and transgender; AOD: alcohol and other drugs; AUDIT-C: Alcohol Use Disorders Identification Test- Consumption; CH: completely heterosexual; ATOD: alcohol, tobacco and other drugs; MSM: men who have sex with men; STI: sexually transmitted infections; NTDS: National Transgender Discrimination Survey; LGBTQ: lesbian, gay, bisexual and questioning; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders Fourth Edition.

to focus our search on the clinical outcomes of depression, suicidality, and substance use in relation to experienced minority stress. This may have excluded important connections between severe traumatic experiences (*e.g.*, child abuse or being rejected by parents, especially at a young age, because of one’s personal sexual preferences) and the development of other mental health problems such as psychotic or anxiety disorders or anxiety disorders. Yet, we considered that depression is currently the leading cause of disability worldwide, and that substance use disorders and suicidality are often consequences of depressive disorders. As research indicated, the latter are linked to perceived minority stress, and represent a key-issue for the general population as well as for minorities. To conclude, the criteria adopted, though limiting the study, also made it feasible. Further research aiming to overcome the limitations hereby highlighted is currently on our research agenda (Table IV).

Conclusions

The present study showed how in the last five years researchers have increasingly explored minority stressors reported by LGBT populations and their mental health effects. Our work is aligned with the imperative to better understand the mental health needs of sexual minorities and the causes of mental health disparities, in order to effectively address them. Our findings also indicate that some important progresses have been made in understanding the mechanisms underlying depression, suicidality, and substance use in LGBT populations. Strong evidence is being collected around the framework offered by the minority stress model, and many works reviewed

in our paper offer interesting insights for specific subpopulations. The “double discrimination” suffered by bisexual individuals, older homosexuals, ethnic minority LGB individuals, and transgender adults is a clear example of this. We highlight the importance of studying the minority stress model across different cultural contexts, especially because a limitation quite often found in the majority of these studies was the predominance of white/Caucasian individuals surveyed compared to other ethnic groups. This limitation prevents researchers from exploring the possibly relevant confounding factors of ethnicity and sexual minority position. The majority of the papers also have a cross-sectional design, which does not allow researchers to infer causality. Online recruitment methods and the predominance of urban samples are two other important limitations often found in articles included in this work.

As our review shows, this is a rapidly growing area of research, especially regarding mental health outcomes and important implications for policies. Future studies should adopt a longitudinal design to assess causality. Additionally, future research should pay specific attention to possible stigma-related intersections due to ethnicity, social background, and other minority features.

These results strongly support the view that LGBTQ-inclusive policies may have a great positive impact on mental health outcomes in sexual minority populations. We therefore expect mental health improvements in the long-term in the areas where such policies are implemented. In the meantime, individual and community-based interventions aiming at greater inclusion of LGBTQ persons, promoting resilience and positive coping of minority stress are actions that may

improve the gap of mental health disparities in the short/mid-term.

Studies with longer follow-up periods would allow researchers to better understand the real impact of policy changes in mental health disparities in long-term consequences.

In addition, more efforts should be made to reduce the disparities in health care: promoting LGBT health interventions, increasing the cultural competency of health care providers, and reducing stigma — specifically in mental health care settings. Mental health professionals should be an essential part of a much-needed effort to overcome barriers for sexual minority populations that are subjected to discrimination throughout their entire life.

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