



Original article

Violence, Discrimination, and High Levels of Symptoms of Depression Among Adolescent Men Who Have Sex With Men and Transgender Women in Brazil



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 A B S T R A C T

Purpose: This study aimed at describing the prevalence of symptoms of depression among 15–19 year old adolescent men who have sex with men (aMSM) and transgender women (aTGW), who were recruited in an HIV pre-exposure prophylaxis cohort study in three Brazilian capital cities. The study also examined potential associations, including violence and discrimination, with severe symptoms of depression among aMSM.

Methods: This is a cross-sectional study of baseline data among 730 aMSM and 56 aTGW recruited between February 2019 and February 2021. Sociodemographic and behavioral data were collected. The 20-item Center for Epidemiologic Studies Depression scale was used to screen for symptoms of depression. Scores of ≥ 22 points indicate the presence of severe symptoms associated with major depression. Logistic regression was used to assess independent associations among aMSM, adjusting for sociodemographic variables.

Results: Our findings indicate a high prevalence of symptoms of depression (overall prevalence = 58.5% and 69.6%; 21.2% and 25.0% for mild/moderate, and 37.3% and 44.6% for severe) among these aMSM and aTGW, respectively. Psychological violence (aOR = 1.74; 95% CI = 1.12–2.70), sexual violence (aOR = 1.79; 95% CI = 1.07–2.98), and discrimination due to sexual orientation (aOR = 1.71; 95% CI = 1.23–2.38) were independently associated with severe symptoms of depression in aMSM.

IMPLICATIONS AND CONTRIBUTION

Brazilian adolescent men who have sex with men (aMSM) and transgender women (aTGW), recruited in an HIV pre-exposure prophylaxis (PrEP) cohort study, had a high prevalence of symptoms of depression. Exposure to psychological and sexual violence and discrimination due to sexual orientation were associated with increased odds of severe symptoms of depression among aMSM.

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Discussion: The high prevalence of severe symptoms of depression and its association with psychological and sexual violence and discrimination creates cycles of vulnerability and carries important public health implications. Thus, our findings indicate public policies should consider assessing depression, psychological and sexual violence, as well as discrimination, especially in populations that will be targeted by interventions, such as the use of pre-exposure prophylaxis.

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Depressive disorders are one of the leading causes of disability and the global burden of disease among young people [1]. In 2019, depression was ranked as the fourth leading cause of disability among those aged 10–24 years old [1]. These disorders usually begin in adolescence and youth [2] and present a high incidence [3], recurrence, and persistence throughout adulthood [2].

The definition of depressive disorders is based on a set of symptoms, such as sadness, loss of interest or pleasure, feelings of guilt or low self-esteem, disturbed sleep or appetite, and feelings of tiredness and lack of concentration, that constitute a syndrome and cause functional impairment [4]. Major depression is diagnosed when five or more symptoms of depression are experienced nearly every day during a 2-week period [5].

The incidence rates of depressive disorders and symptoms of depression are higher among sexual and gender minority populations than in the general population [6,7]. Among these populations, men who have sex with men (MSM) and transgender women (TGW) are disproportionately affected by depression in comparison to the general male population [7,8].

Depressive disorders among young MSM and TGW populations carry important public health implications, including associations with higher rates of self-harm and suicide [1,9], greater engagement in sexual HIV risk behaviors, and less engagement in HIV prevention programs (such as HIV Pre-exposure Prophylaxis–PrEP) [10].

As adolescence is a period marked by biological, psychological, or social transitions, this phase offers great opportunities for health interventions [11]. Detecting symptoms of depression early and understanding its characteristics during this phase can be crucial to minimize its clinical and functional repercussions throughout life [11]. According to the American Academy of Pediatrics [12], universal screening for depression annually from age 12 through 21 years is strongly recommended, especially for adolescents at high risk, which includes those with significant psychosocial stressors, such as family crises, discrimination, physical or sexual abuse, neglect, and other trauma.

Experiences of violence and discrimination during adolescence among MSM and TGW may increase the likelihood of symptoms of depression in adulthood [13,14]. In this context, the minority stress theoretical model is often used to improve understanding of the role of discrimination in the occurrence of symptoms of depression among sexual and gender minorities [15]. Based on sexual minority status, this theory, later expanded to transgender people [9], indicates that MSM and TGW deal with multiple stressors, i.e., perceived and internalized stigma, discrimination, and violence on a daily basis that can negatively affect their mental health [9,15]. Furthermore, exposure to these factors begins at a very early age, mainly for TGW, and may represent a cumulative effect over a lifetime [9,16].

Considering that adherence to PrEP may be impaired by depression [17], and given the existing research gaps with respect to investigations into the relationship between violence and discrimination and symptoms of depression among adolescent MSM (aMSM) and adolescent TGW (aTGW), this study aimed at describing the prevalence of symptoms of depression among 15–19 year old aMSM and aTGW, recruited in an HIV PrEP cohort study in three Brazilian capital cities. The study also examined potential associations, including violence and discrimination with severe symptoms of depression among aMSM.

Methods

Study design and population

This is a cross-sectional analysis of the PrEP1519 cohort study baseline data.

The inclusion criteria for the PrEP1519 cohort study were: aMSM and aTGW between the ages of 15 and 19 years who had had at least one sexual relationship with another cisgender man or transgender person; had reported living, studying, or working in one of the study sites; and had presented a nonreactive result for a rapid HIV test at the time of enrollment. The exclusion criteria were: individuals under the influence of alcohol or other drugs at the time of the interview or who presented any mental condition that would compromise their participation in the study. Further details about the PrEP1519 study have been previously published [18].

In this analysis, we included aMSM and aTGW between 15 and 19 years old and recruited between February 2019 and February 2021 in three Brazilian capitals: Belo Horizonte, Salvador, and São Paulo.

Data Collection

Young peer educators used various demand creation strategies to recruit adolescents to participate in the PrEP1519 study at meeting places (public squares, parties, schools, and universities) through social media platforms (Instagram, WhatsApp, Facebook, Twitter, YouTube; and via online dating apps (Grindr, Tinder, and Badoo).

A structured sociobehavioral questionnaire was used to interview the participants. It included information on socio-demographics, sexual practices, use of alcohol and other drugs, history of violence, and discrimination. Trained interviewers and health professionals recorded all information into an online data collection platform; all answers were self-reported.

Variables

Outcome. The outcome of this study was symptoms of depression (none, mild/moderate, and severe/high levels), based on the Center for Epidemiological Studies Depression Scale (CES-D Scale), which assesses the presence of self-reported symptoms experienced in the past week [19]. This scale has 20 response items, and total scores can range from 0 to 60. A three-category version of CES-D Scale scores was used as the dependent variable: none - scores of 15 and below; mild/moderate levels of symptoms - scores from 16 to 21; and severe/high levels of symptoms - scores of 22 and above. The cutoff score of 21 for severe/high levels of depression has been used in studies with the MSM population [20], has already been widely validated and used for screening for depression among adolescents [21,22], including the LGBTQIA + population [23] and the iPrEx study [17]; therefore, it was adopted in this analysis.

Explanatory variables. Independent variables were organized into blocks (Figure 1). Sociodemographic variables were: study center (Belo Horizonte, Salvador, and São Paulo), age (15–17, 18–19 years old); sexual orientation (gay, heterosexual, and bisexual); race/skin color (white/yellow/indigenous, black/brown); schooling (primary/youth and adult education, secondary and higher education); socioeconomic score (higher, lower). This score was based on the point system for the structure of goods and services existing in the household (bathroom, computer, car, motorcycle, and monthly services of a domestic worker), mentioned in the Brazilian economic classification criterion [24]. We used the median to categorize the score: lower score, up to six points; and higher score, seven points or more.

The second block included behavioral variables: age at the first sexual intercourse (<15 years old, ≥15 years old); frequency of alcohol use in the last 3 months (up to 4 times a month, five or more times a month); and use of illicit drugs (no use, at least once a month). For this variable, we considered the use of cannabis, nitrite “poppers”, cocaine, club drugs (i.e., ketamine, ecstasy, and lysergic acid diethylamide), gamma

hydroxybutyrate, bath salts, and crack cocaine or solvents in the last 3 months.

The third block included contextual variables related to violence and discrimination. Psychological, physical, and sexual violence perpetrated by the sexual or affective partner during lifetime were, respectively, defined using the following questions: “Your partner has threatened, frightened, or harassed you”, “Your partner has slapped, punched, kicked, or shoved you”, and “Your partner has forced you to have sex against your will, in a humiliating way, under coercion, or by threat”. The categories for these variables were “never” and “with at least one partner”. To assess discrimination based on sexual orientation or gender identity in the last six months, we chose to construct a new variable using latent class analysis (LCA) for each group of adolescents: MSM and TGW. We used 15 questions for the LCA for sexual orientation discrimination (Table 1). The response options were categorized into “not once” and “at least once”.

Data analysis

We only used data from participants who had completed both the sociobehavioral questionnaire and the CES-D scale at the baseline of the cohort ($n = 730$ aMSM and $n = 56$ aTGW). Descriptive analysis was conducted separately for aMSM and aTGW and a chi-square test was used to compare differences between the two groups.

LCA is a statistical method used to construct latent variables from observable ones by classifying similar individuals into latent classes when a set of categorical variables are highly dependent on each other [25]. We used the parsimony and interpretability of the model, entropy, and the Bayesian and the Akaike information criterion to select the final LCA model. We fit and compared models by the number of latent classes and chose the model with two classes (classified as “high” and “low” frequency of discrimination) for aMSM and aTGW. We used R, version 4.0.5, to perform the LCA and Mplus 5.21 to assess entropy. The latent variables were exported to Stata software.

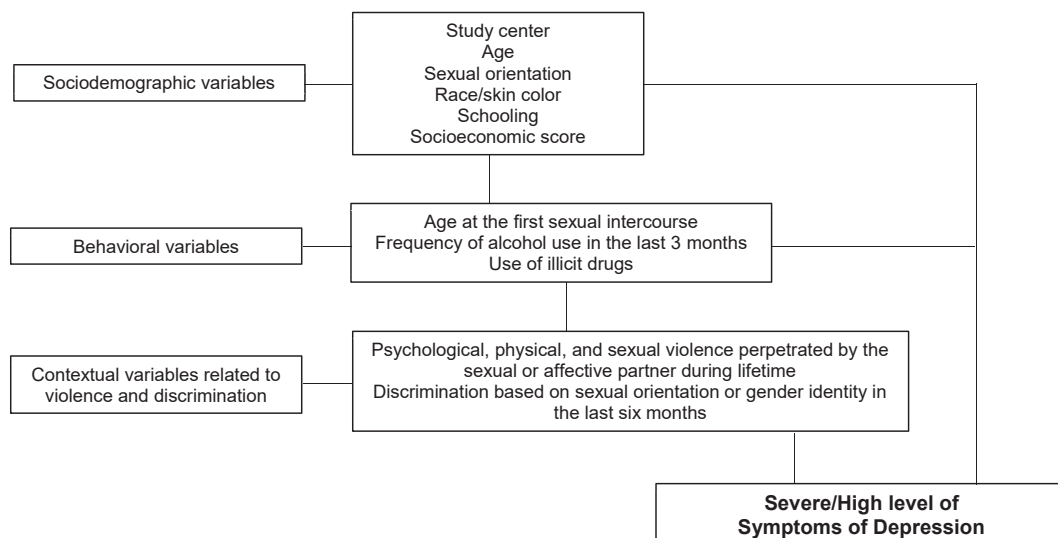


Figure 1. Conceptual model of analysis for the symptoms of depression among the aMSM population. PREP1519 study, 2021.

Table 1

Description of the variables constituting dimensions of discrimination due to sexual orientation or gender identity in the previous six months for the latent class analysis. PREP1519 study, 2021

| Discrimination due to sexual orientation or gender identity in the previous six months |
|---------------------------------------------------------------------------------------------------|
| Work/school |
| a. You were not selected or were released from employment. |
| b. You were mistreated/discriminated against at work. |
| c. You were mistreated or marginalized by fellow students at school/college/program. |
| d. You were mistreated or marginalized by professors at school/college/program. |
| Private spaces |
| e. You were excluded or marginalized from a group of friends. |
| f. You were excluded or marginalized by neighbors. |
| g. You were excluded or marginalized in your family environment. |
| h. You were excluded or marginalized in a religious environment. |
| Public spaces |
| i. You were mistreated in health services or by health professionals. |
| j. You were mistreated by police officers or at police stations. |
| k. You were mistreated in public services (shelters, city councils, transportation). |
| l. You were mistreated in or prevented from entering commercial establishments/places of leisure. |
| m. You were harassed in social networks or other virtual environments. |
| n. You were blackmailed, or money was extorted from you. |
| o. You felt afraid to walk in public spaces. |

Symptoms of depression were dichotomized as follows: those with 22 or more points in the CES-D scale (i.e., severe/high levels of symptoms of depression, which are usually associated with major depression) were compared to those with 21 or fewer points (i.e., none or mild/moderate symptoms of depression).

The associations between potential explanatory variables and severe symptoms of depression were performed only among aMSM for two main reasons: first, because of the difference between the two groups, we could not collapse the two in one category due to the high degree of heterogeneity; and, second, the option of carrying out a stratified analysis was impaired by the small number of the aTGW group, thus with a lower statistical power for a meaningful analysis of associations, including a multivariate model.

Univariate analysis was used to estimate the association of explanatory variables with severe/high levels of symptoms of depression for the aMSM. For this analysis, the variable sexual orientation was dichotomized as gay and heterosexual/bisexual. Chi-square test was used for categorical variables. The magnitude of the associations was estimated by the odds ratio (OR) with 95% CI for both analyses, using logistic regression. Variables with p values $< .20$ in the univariate analysis were used to begin modeling, and only those with p values $< .05$ remained in the final model, after adjusting for sociodemographic variables. Goodness-of-fit of the final model was assessed by the Hosmer-Lemeshow test. These analyses were conducted using Stata statistical software (version 15.1) (StataCorp LP, College Station, USA).

Ethical aspects

The PrEP1519 study was performed according to the Brazilian and international research ethics guidelines and was approved by the Research Ethics Committees of the World Health Organization (Protocol ID: Fiotec-PrEP Adolescent study), Federal University of Bahia (#3,224,384), University of

São Paulo (#3,082,360), and Federal University of Minas Gerais (#2,027,889). Written informed consent (WIC) was sought and obtained from the adolescents aged 18 and 19 years old. For those under 18, each city followed a different protocol according to local court decisions: Belo Horizonte had the WIC signed by the parents or guardian as mandatory followed by the assent form (AF) signed by the adolescents; Salvador had two possibilities: i) WIC signed by a parent or guardian and AF by the adolescent; or ii) just AF signed by the adolescent in cases in which the team's psychologist and social worker judged that their family ties had been severed or that they were at risk of violence due to their sexual orientation; and São Paulo had just the AF signed by the adolescents. All participants could withdraw consent at any stage of the process or skip any questions perceived as too sensitive, too personal, or distressing.

Results

In the study period, 770 aMSM and 60 aTGW were recruited. A total of 730 aMSM and 56 aTGW participants had completed both the sociobehavioral questionnaire and the CES-D scale at the baseline of the cohort and were included in this analysis.

Severe/high levels of symptoms of depression were found in 37.3% and 44.6% of the aMSM and aTGW participants, respectively. The prevalence of mild/moderate symptoms of depression was 21.2% and 25.0%, and of no symptoms was 41.5% and 30.4%, respectively, for aMSM and aTGW. Most of the adolescents lived in São Paulo, were 18–19 years old, black or brown; had a lower economic status score, and a secondary or higher education. Sexual orientation was reported by 73.2% of aMSM as gay and by 66.1% of aTGW as heterosexual. In both groups, most of the participants were 15 years old or more at the first sexual intercourse, and used alcohol up to 4 times a month. The frequency of illicit drugs use in the last three months was mostly less than once a month for the aMSM and at least once a month for the aTGW (Table 2).

Psychological violence was reported by 16.6% and 23.2%; sexual violence by 11.6% and 25.0%; and physical violence by 11.2% and 17.9% of the aMSM and aTGW, respectively. The proportion of high frequency of discrimination based on sexual orientation or gender identity was 32.7% for aMSM and 33.9% for aTGW (Table 2). Statistical differences between the two groups were found for the age, sexual orientation, schooling, age of first sexual intercourse, and occurrence of physical violence.

Severe/high level of symptoms of depression was more prevalent among aMSM who lived in Belo Horizonte (38.2%), were older (38.1%), black or brown (38.3%), with lower economic status (39.5%), lower level of schooling (41.7%), identified as heterosexual or bisexual (40.8%), were 15 years old or more at the first sexual intercourse (38.8%), used alcohol five or more times a month (41.8%), and used illicit drugs at least once a month (41.0%). However, no statistically significant ($p < .05$) differences were observed among those variables (Table 3). On the other hand, having suffered psychological, sexual, or physical violence perpetrated by the sexual or affective partner, and high frequency of discrimination based on sexual orientation or gender identity were associated with a higher prevalence of severe symptoms of depression (54.5%, 50.0%, 57.6%, and 48.7%, respectively) (Table 3).

In the multivariate analysis, aMSM who reported psychological (aOR = 1.74; 95% CI = 1.12–2.70) and sexual violence (aOR = 1.79;

Table 2

Prevalence of symptoms of depression and description of the aMSM (n = 730) and aTGW (n = 56) population in the PREP1519 study, Brazil, 2021

| Variables | aMSM | | aTGW | | p value |
|-----------------------------------------------------------------------------|------|------|------|------|---------|
| | n | % | n | % | |
| Symptoms of depression | | | | | .262 |
| None (up to 15 points) | 303 | 41.5 | 17 | 30.4 | |
| Mild/moderate levels (16–21 points) | 155 | 21.2 | 14 | 25.0 | |
| Severe/high levels (22 points or more) | 272 | 37.3 | 25 | 44.6 | |
| Study site | | | | | .365 |
| Belo Horizonte | 170 | 23.3 | 16 | 28.6 | |
| Salvador | 270 | 37.0 | 23 | 41.1 | |
| São Paulo | 290 | 39.7 | 17 | 30.4 | |
| Age | | | | | .001 |
| 15–17 | 131 | 17.9 | 20 | 35.7 | |
| 18–19 | 599 | 82.1 | 36 | 64.3 | |
| Sexual orientation | | | | | <.001 |
| Gay | 534 | 73.1 | 6 | 10.7 | |
| Heterosexual | 5 | 0.7 | 37 | 66.1 | |
| Bisexual | 191 | 26.2 | 13 | 23.2 | |
| Race/skin color | | | | | .442 |
| White/yellow/indigenous | 218 | 29.9 | 14 | 25.0 | |
| Black/brown | 512 | 70.1 | 42 | 75.0 | |
| Economic status score | | | | | .051 |
| Lower | 397 | 54.4 | 38 | 67.9 | |
| Higher | 333 | 45.6 | 18 | 32.1 | |
| Schooling | | | | | <.001 |
| Primary/youth and adult education | 48 | 6.6 | 20 | 35.7 | |
| Secondary and higher education | 682 | 93.4 | 36 | 64.3 | |
| Age at the first sexual intercourse | | | | | .001 |
| <15 years old | 293 | 41.4 | 19 | 34.6 | |
| ≥15 years old | 415 | 58.6 | 36 | 65.4 | |
| Frequency of alcohol use in the last 3 months | | | | | .959 |
| Up to 4 times a month | 543 | 74.7 | 42 | 75.0 | |
| 5 times a month or more | 184 | 25.3 | 14 | 25.0 | |
| Use of illicit drugs in the last 3 months | | | | | .332 |
| Not used or less than once a month | 374 | 51.4 | 25 | 44.6 | |
| At least once a month | 354 | 48.6 | 31 | 55.4 | |
| Psychological violence | | | | | .203 |
| Never | 609 | 83.4 | 43 | 76.8 | |
| With at least one partner | 121 | 16.6 | 13 | 23.2 | |
| Physical violence | | | | | .002 |
| Never | 648 | 88.8 | 42 | 75.0 | |
| With at least one partner | 82 | 11.2 | 14 | 25.0 | |
| Sexual violence | | | | | .169 |
| Never | 645 | 88.4 | 46 | 82.1 | |
| With at least one partner | 85 | 11.6 | 10 | 17.9 | |
| Sexual orientation or gender identity discrimination in the last six months | | | | | .872 |
| Low frequency | 490 | 67.1 | 37 | 66.1 | |
| High frequency | 240 | 32.9 | 19 | 33.9 | |

95% CI = 1.07–2.98), and discrimination (aOR = 1.71; 95% CI = 1.23–2.38) had an increased chance of severe/high levels of symptoms of depression, after adjusting for the study site, age, race/ethnicity, economic status, and schooling (Table 4).

Discussion

In this study, we observed that the prevalence of symptoms of depression (overall 58.5% and 69.8%, 21.2% and 25.0% mild/moderate, and 37.3% and 44.6% severe, for aMSM and aTGW, respectively) among adolescents was very high in comparison to other studies with the Brazilian adolescent population [26,27]. It was also higher than moderate/severe symptoms of depression among adult MSM in Brazil (24.9%) [28].

Table 3

Univariate analyses between the explanatory variables and severe/high levels of symptoms of depression among aMSM (n = 730), PREP1519, Brazil, 2021

| Variables | n* | P (%) [†] | p value | OR [‡] | 95% CI [§] |
|------------------------------------------------------|-----|--------------------|---------|-----------------|---------------------|
| Study site | | | .947 | | |
| Belo Horizonte | 65 | 38.2 | | 1.00 | - |
| Salvador | 99 | 36.7 | | 0.93 | 0.63–1.39 |
| São Paulo | 108 | 37.2 | | 0.96 | 0.65–1.42 |
| Age | | | .337 | | |
| 15–17 | 44 | 33.6 | | 1.00 | - |
| 18–19 | 228 | 38.1 | | 1.21 | 0.82–1.81 |
| Sexual orientation | | | .229 | | |
| Gay | 192 | 36.0 | | 1.00 | - |
| Heterosexual/bisexual | 80 | 40.8 | | 1.23 | 0.88–1.72 |
| Race/skin color | | | .382 | | |
| White/yellow/indigenous | 76 | 34.9 | | 1.00 | - |
| Black/brown | 196 | 38.3 | | 1.16 | 0.83–1.61 |
| Economic status score | | | .163 | | |
| Lower | 157 | 39.5 | | 1.00 | - |
| Higher | 115 | 34.5 | | 0.81 | 0.60–1.09 |
| Schooling | | | .514 | | |
| Primary/youth and adult education | 20 | 41.7 | | 1.00 | - |
| Secondary and higher education | 252 | 36.9 | | 0.82 | 0.45–1.49 |
| Age at the first sexual intercourse | | | .479 | | |
| <15 years old | 106 | 36.2 | | 0.89 | 0.66–1.22 |
| ≥15 years old | 161 | 38.8 | | 1.00 | - |
| Frequency of alcohol use in the last 3 months | | | .138 | | |
| Up to 4 times a month | 194 | 35.7 | | 1.00 | - |
| 5 times a month or more | 77 | 41.8 | | 1.29 | 0.92–1.82 |
| Use of illicit drugs in the last 3 months | | | .051 | | |
| Not used or less than once a month | 127 | 34.0 | | 1.00 | - |
| At least once a month | 145 | 41.0 | | 1.35 | 1.00–1.82 |
| Psychological violence | | | <.001 | | |
| Never | 206 | 33.8 | | 1.00 | - |
| With at least one partner | 66 | 54.5 | | 2.35 | 1.58–3.49 |
| Physical violence | | | .011 | | |
| Never | 231 | 35.6 | | 1.00 | - |
| With at least one partner | 41 | 50.0 | | 1.80 | 1.14–2.86 |
| Sexual violence | | | <.001 | | |
| Never | 223 | 34.6 | | 1.00 | - |
| With at least one partner | 49 | 57.6 | | 2.58 | 1.63–4.08 |
| Sexual orientation or gender identity discrimination | | | <.001 | | |
| Low frequency | 155 | 31.6 | | 1.00 | - |
| High frequency | 117 | 48.7 | | 2.06 | 1.50–2.82 |

* n = absolute frequency.

† P = Prevalence of severe/high levels of symptoms of depression.

‡ OR = Crude odds ratio.

§ 95% CI: 95% confidence interval.

We found strong associations between sexual and psychological violence perpetrated by the sexual or affective partner, as well as higher sexual orientation-based discrimination, with severe symptoms of depression, thus corroborating the minority stress theory, reinforcing the hypothesis that the accumulation of stress experienced by aMSM throughout their lives may determine negative mental health outcomes [9,15,16].

In general, the prevalence of symptoms of depression varies across studies due to the scales used and the cutoff scores established. Brazilian studies that adopted the same scale and established a cutoff score of 16 points found lower values than those presented by the aMSM and aTGW. A cohort in Pelotas, Brazil, with 22-year-olds found a prevalence of 19.17% [26], while a national study found values ranging from 28.2% to 30.6% among adolescents and youth between the ages of 14 and 24 years [27]. Using the same scale and a cutoff score of 21, a study with young

Table 4

Multivariate analysis between the explanatory variables and severe/high levels of symptoms of depression among aMSM (n = 730). PREP1519, Brazil, 2021

| Variable | aOR* | 95% CI† |
|------------------------------------------------------|------|-----------|
| Psychological violence | | |
| Never | 1.00 | - |
| With at least one partner | 1.74 | 1.12–2.70 |
| Sexual violence | | |
| Never | 1.00 | - |
| With at least one partner | 1.79 | 1.07–2.98 |
| Sexual orientation or gender identity discrimination | | |
| Low frequency | 1.00 | - |
| High frequency | 1.71 | 1.23–2.38 |

Hosmer-Lemeshow = 126.88; $p = .5611$.

* aOR = Odds Ratio of the multivariate analysis, adjusted for the variables: study site, age, race/ethnicity, economic status score, and schooling.

† 95% CI: 95% confidence interval.

MSM in the United States of America [20] reported a prevalence of 16.0% for major symptoms of depression among the ages of 18 and 29 years, which is also lower than the prevalence found in our study (37.3%).

Although symptoms of depression are common in adolescence [3], vulnerable populations, which include MSM and TGW, are much more affected than the general population in a predominantly heteronormative society, especially in late adolescence and early adulthood [29].

The current context in Brazil is an environment that is unfavorable for the MSM population. Perception of discrimination due to sexual orientation among adult MSM, measured by two cross-sectional studies in several Brazilian capitals, increased by 37.5% in 7 years: from 27.7% in 2009 to 65.0% in 2016 [30]. According to the authors, it is not known to what extent an increased visibility of MSM, setbacks in human rights initiatives, or both, may have contributed to this situation. It is also noteworthy that backlash from sexual and reproductive health and human rights organizations and overlapping racist, religion-based conservatism and sexism groups have impacted comprehensive sexual education programs for adolescents in Brazil's public schools [31].

Moreover, the COVID-19 pandemic has required implementing measures of physical distancing and social isolation, thus contributing to greater mental distress [32]. Among LGBTQ youth, some of the difficulties included isolation in unsupportive families, and loss of socialization and support based on personal identity. Study data were collected during the pandemic, which may have led to some degree of overestimation of the prevalence found.

Depression is the result of a unique combination of factors for each person affected. Adolescent MSM and aTGW are more affected by social exclusion and marginalization, poverty, violence, and discrimination, which can compromise their mental health [10,33]. Among adult MSM, there is evidence of a strong effect between a combination of syndemic conditions and the prevalence of depressive symptoms [28].

Among the factors found to be associated with severe symptoms of depression among aMSM, greater psychological and sexual violence by the partner was shown to increase the chance of symptoms by 74% and 79%, respectively. This finding is similar to a study with adult MSM populations in the United Kingdom, which found a prevalence ratio of 2.57 for the association with intimate partner violence, suggesting those

experiences can have a lasting adverse impact on mental health [14].

Sexual violence generated feelings of isolation and fear of rejection, and had a negative impact on self-esteem in a cis-gender population [34,35]. In addition to these effects, studies in sexual minority populations point to losing a social connection within their community as a greater risk of suicidal ideation. Violence in adolescence may also increase the risk of sustained symptoms of depression in adulthood [13]. This fact further reinforces the need for preventive strategies that target aMSM and aTGW.

Finally, discrimination based on sexual orientation or gender identity was an important factor associated with severe symptoms of depression among aMSM in our study. We found a 32.9% prevalence of higher discrimination, which increased the chance of severe symptoms of depression by 71%. The association between discrimination and depression for sexual minorities is widely described in the literature [9,15,33,36]. As sexual orientation-based discrimination occurs in many environments, such as families, schools, virtual environments, and public services, experiencing various types of discrimination can compromise mental health and lead to symptoms of depression [37].

The aMSM and aTGW participating in this study are at high risk for HIV infection. The high prevalence of symptoms of depression associated with psychological and sexual violence and discrimination may hinder adherence to PrEP. An analysis of the iPrEx study evaluated the relationship of depressive symptoms and adherence to daily oral PrEP; MSM with CES-D scores greater than 26 were less likely to have protective drug levels compared to those in the lowest CES-D category (OR = 0.41) [17]. Thus, our findings indicate that assessing depression among MSM upon initiating PrEP may be useful in identifying adolescents who need more support, such as guidance for adhering to PrEP, as well as treatment for depression.

Interventions targeting symptoms of depression and other psychosocial aspects can help to increase adherence to HIV combination prevention programs, such as PrEP services [38,39]. The WHO has already recommended that PrEP programs screen for problems that are common causes of low adherence, such as mental health, substance use, and emotional and social problems, including gender-based violence [40]. Our results indicate that additional screening for intimate partner violence, sexual violence, and discrimination can direct and improve referrals.

This study presents some limitations. A cross-sectional evaluation of the cohort baseline does not warrant a temporal relationship between the variables studied. Therefore, a longitudinal data analysis will be necessary, especially to assess the variation in symptoms of depression throughout the study. Furthermore, we used a convenience sample based mainly on recruiting adolescents through social media may have introduced a potential participation bias. We were also limited to assess associations with severe symptoms of depression only among aMSM due to the small number of aTGW in our sample. Further studies with this group should be pursued. Finally, the influence of the COVID-19 pandemic during the recruitment of the adolescents cannot be ruled out, it may have made access to services difficult and also increased the prevalence of severe symptoms of depression due to social isolation [32].

Despite these limitations, this study contributes to understanding the effects of violence and discrimination on mental health and is the first to address the aMSM and aTGW population

based on a multicentric study in Brazil. Our findings emphasize the need to assess symptoms of depression in this population in order to provide adequate diagnosis and treatment. Psychological and sexual violence, as well as discrimination, should also be assessed, especially for those who will initiate PrEP use. This will facilitate intervention and improve referrals, when necessary.

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