RESEARCH ARTICLE

Depression and thoughts of self-harm or suicide among gender and sexually diverse people in a regional Australian community

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Abstract

Issues Addressed: There is a paucity of data regarding depression and thoughts of self-harm or suicide among gender and sexually diverse (GSD) people living within Australian regional/rural locations. This study aims to elucidate these issues and fill a critical gap.

Methods: The sample included 91 GSD people from a regional community in South-West Queensland utilising the PHQ-9 to determine presence/severity of depression and self-harm/suicide ideation. These data were drawn from a larger health and well-being survey. Raw mean scores were calculated to determine prevalence/severity of clinical symptoms. Bayesian ordinal regression models were employed to analyse between-subgroup differences in depression and self-harm/suicide ideation.

Results: Overall, 80.2% of GSD sample experienced depression (35.2% severe, 45.1% mild/moderate) and 41.8% experienced self-harm/suicide ideation in the past two-weeks. Trans and nonbinary people experienced higher levels of depressions than sexually diverse cisgender people. Pansexual and bisexual people experienced higher levels of depression than gay people. Trans people experienced higher prevalence of self-harm/suicide ideation than cisgender and nonbinary people, with no differences between sexuality subgroups.

Conclusions: These findings contribute to deeper and more nuanced insights regarding clinically salient depressive and self-harm/suicide ideation symptoms among trans, nonbinary, bisexual, pansexual and queer people in regional Australian communities, with the aim to ultimately reduce mental health prevalence, improve mental health outcomes and health promotion among GSD people.

So What? The current findings revealed GSD people experience high prevalence of depression and self-harm/suicide ideation indicating tailored mental health awareness-raising, training and health promotion is warranted to enhance psychological support.

KEYWORDS
depression, gender diverse, PHQ-9, regional Australia, self-harm ideation, sexually diverse, suicide ideation

1 | INTRODUCTION

It has been well recognised that people who identify as gender and sexually diverse (GSD) experience increased levels of depression, self-harm and suicide compared to their cisgender and heteronormative counterparts, with a paucity of information about regional and rural GSD people experiences compared to suburban and metropolitan areas.[1–7] Australian GSD people are reported to experience depression at a rate nearly six times that of the general population with 60.5% of participants in *Private Lives 3*[8] (PL3) compared to the *National Study of Mental Health and Wellbeing*[9] by the Australian Bureau of Statistics reporting 10.4%.[10] Additionally, GSD people experience lifetime self-harm and thoughts of suicide almost four and a half times more compared to the general population, with 74.8% of PL3[8] participants considered attempting suicide at some point during their lives, and 40.8% of participants in *Growing up Queer*[11] had thought about self-harm and/or suicide, compared with the *National Study of Mental Health and Wellbeing*[9] where 8.8% of the Australian general population reported ever self-harmed and 16.7% had ever experienced suicidal thoughts or behaviours. Compared to GSD people who reside in capital cities of Australia (e.g., Brisbane, Sydney, Melbourne), those who reside in regional towns experience higher rates of depression, self-harm and suicide. GSD people in PL3[8] who resided in regional areas reported higher rates of depression with 42.6% ever diagnosed with depression compared to 35.9% of participants who resided in capital cities. Of GSD people who had ever had suicidal thoughts, 77.5% resided in regional areas and 71.0% in capital cities, and 33.9% of GSD people in regional areas had attempted suicide compared with 25.8% in capital cities. Further, GSD people in *Writing Themselves in 4*[12] reported self-harm rates of 65.3% in regional areas compared to 54.1% in capital cities. Such mental health disparities can be attributed to unique and cumulative experiences of social stressors and psychological processes as explained by Minority Stress Theory[13,14] and the Psychological Mediation Framework.[15] Minority Stress Theory posits social stressors such as stigmatisation (e.g., homophobia/transphobia), prejudice, discrimination, victimisation (e.g., verbal/physical violence) and non-affirmation of gender identity—coupled with negative expectations (e.g., rejection), internalised homophobia/transphobia and concealment/identity non-disclosure experienced by GSD people, increases predisposition to poorer mental health outcomes.[13,14] The Psychological Mediation Framework builds on Minority Stress Theory by further explaining stigma-related social stressors mediated by psychological processes such as social isolation, helplessness, low self-esteem, emotion dysregulation (e.g., negative rumination) and substance use—all contributing to the development of psychopathology.[15]

GSD people represent a heterogeneous group with vast individual differences regarding their experiences of depression, self-harm and suicide.[3,5,6,16] Studies with lesbian, gay and bisexual (LGB) populations have found bisexual people experience greater mental distress,[17] depression[2] and suicide[6] than gay/lesbian people. Furthermore, emerging research suggests GSD subpopulations (e.g., pansexual, queer, trans), in addition to bisexuals, experience typically higher levels of depression, self-harm and suicide compared to gay/lesbian people. For example, a large Canadian survey (n = 2778) of people who identify within gender and sexual priority groups found bisexual and queer, and pansexual people had two and three times the likelihood (respectively) of having depression (as assessed by the PHQ-9) compared to gay/lesbian people.[16] Within the Australian context a similar pattern was reported in PL3 by Hill et al.[8] noting pansexual, queer and bisexual adults experienced higher rates of depression compared to lesbian/gay people. An international systematic review and meta-analysis by Marchi et al.,[5] investigating self-harm and suicide behaviours, found bisexual participants had the highest risk of suicidal ideation (odds ratio [OR] 5.0) and self-harm (OR 5.0) compared to heterosexual people, followed by trans/intersex/queer (OR 3.5) and lesbian/gay (OR 2.6) subgroups regarding suicidal ideation; and lesbian/gay (OR 3.9) and trans/intersex/queer (OR 3.4) subgroups regarding self-harm compared to heterosexual people. The *Australian National Epidemiological Study of Self-Injury* survey[18] (n = 12 006) of LGB people compared to heterosexual people reported gay men and bisexual women had greater odds (3.0 and 4.4, respectively) of reporting suicidal ideation compared to their heterosexual counterparts; and bisexual women had more than 19 times the odds of reporting self-harm. Furthermore, an analysis conducted with data from the 2019 Australian *Writing Themselves In 4*[19] study revealed pansexual participants had slightly higher odds of experiencing recent suicidal ideation (past 12 months) than lesbians and bisexuals when compared to gay participants (1.6 vs. 1.5).

Among people who experience mental illness or suicide ideation, and suicide plans and attempts are more prevalent when compared to mentally healthy counterparts.[20] For example, an analysis of the Queensland Suicide Register investigating suicide by Skerrett et al.[21] revealed depression was 2.4 times more likely (70.6% vs. 52.4%)

linked with lesbian, gay, bisexual and trans (LGBT) identity than non-LGBT suicide deaths. Evidence also suggests people who identify as both gender *and* sexually diverse have further increased mental health disparities compared to those who have one of these intersectional forms of oppression.[1]

Limited data are available on depression and thoughts of self-harm or suicide among GSD people living within regional/rural locations in Australia. While there are limited studies within the Australian context, historically there has been more focus on LBG research[22–25] than other GSD priority subpopulations. Considering individual variations in experiences of depression, self-harm ideation and suicidal ideation among unique GSD subpopulations beyond LGB (nonbinary, pansexual, queer, etc.), as suggested by the literature, a better understanding of the extent and diversity of experiences among LGBT, nonbinary, pansexual and queer people is required to enhance mental health outcomes through further clinician training, specialised services and targeted interventions. Thus, the current study presents a unique opportunity to advance critically needed understanding in this space with the aim of the present research to determine the presence and severity of self-reported depression and thoughts of self-harm or suicide among GSD people living within the regional area of Toowoomba in South-West Queensland, Australia. This will be addressed by the following four research questions (RQs):

> **RQ1.** How prevalent is the experience of depression among GSD people living within the Toowoomba region, Australia?

> **RQ2.** Do some gender subgroups (cisgender, nonbinary and trans) and sexuality subgroups (bisexual, gay, lesbian, pansexual, and queer) experience higher levels of depression than others?

> **RQ3.** How prevalent are thoughts of self-harm or suicide among GSD people living within the Toowoomba region, Australia?

> **RQ4.** Do some gender subgroups (cisgender, nonbinary and trans) and sexuality subgroups (bisexual, gay, lesbian, pansexual, and queer) experience higher levels of thoughts of self-harm or suicide than others?

2 | METHODS

2.1 | Sample

Data for this study were derived from the larger *Safe Connections Toowoomba: Connecting and Supporting LGBTQIA+ Communities* Survey conducted from March–May 2022.[26] Other data collected in the larger project are beyond the scope of the current study. Ethics approval was granted by the University of Southern Queensland's Human Research Ethics Committee: (Approval number H21REA146), and participants provided informed consent/assent prior to

TABLE 1 Participant counts by gender and sexuality subgroups (N = 91).

Variable	N
Gender (n = 89)	
Cisgender (n = 47)	
Cis man	19
Cis woman	28
Nonbinary	22
Trans (n = 40)	
Brotherboy	1
Sistergirl	2
Trans man	6
Trans nonbinary	9
Trans woman	22
Sexuality (n = 80)	
Bisexual	16
Gay	16
Lesbian	10
Pansexual	15
Queer	23
Age years M (SD)	32.4 (12.4)

Note: Table 1 represents 91 participants. For gender variables, one participant did not indicate their gender, while another selected the option of 'Not listed'. For sexuality variables, 11 participants have been excluded from these counts: these individuals identified as asexual or heterosexual, selected the option 'Something else' for their sexuality, or did not provide information about their sexuality.
Abbreviations: M, mean; SD, standard deviation.

participating in the survey. Participants were recruited through flyers/posters, social media posts and local GSD community groups. Participants were eligible if they self-identified as lesbian, gay, bisexual, trans, Sistergirl, Brotherboy, queer, pansexual and/or any other self-identifying GSD person who resided within the greater Toowoomba region. People who were both cisgender *and* heterosexual (and not born with an intersex variation) were ineligible to participate. There was a total of 91 GSD participants included in the analysis; they were aged between 15 and 71 years (M = 32.4, SD = 12.4).[1] Table 1 shows the participants grouped by gender (n = 89); one participant selected 'Not listed' and another did not indicate their gender and are thus not shown. The same participants are grouped by sexuality (n = 80); 11 participants who identified as asexual, heterosexual, selected 'Something else' or did not indicate their sexuality are not shown. Appendix Table A1 displays the counts by gender and sexuality of the 91 participants.

2.2 | Material

The current study focuses on responses to the nine-item self-report depression scale Patient Health Questionnaire (PHQ-9)[27] designed to assess major depressive disorder as defined by the *Diagnostic and*

Statistical Manual of Mental Disorders V[28] in terms of presence and severity of depression. For each item of the PHQ-9, participants were asked to rate on a four-point scale (0 = 'Not at all' to 3 = 'Nearly every day') over the last 2 weeks, how often they had been bothered by any of the following concerns (see Appendix Table A2). The depression-severity score for a given individual can range from 0 to 27, with the PHQ-9 scores defined as: no depression (≤4), mild/moderate depression (5–14), and severe depression (≥15).[27] The PHQ-9 has demonstrated validity and test–retest reliability[29,30] and has been validated for use in research focused on sexuality priority groups[31] and among transgender women.[32] To verify the internal consistency of the PHQ-9 scale within this study, we used *ordinal alpha*[33]; the value of this metric was .96. According to Nunnally and Bernstein,[34] alpha values above .70 are acceptable; therefore, we deemed the PHQ-9 scale to be internally consistent.

The gender and sexual identity of participants were assessed with the following questions: 'In your own words, describe your gender' and 'Which of the following best describes your gender?' and 'Which of the following best describes your sexual orientations?' For the multiple response questions participants were asked to select *all that apply* from a list of options (see Appendix Table A3 for details). Due to the nuanced and evolving nature of gender and sexuality, participants were given the option to state in free text their identity (these data were beyond the scope of the current study to be reported).

2.3 | Data analysis

To answer RQ1, we calculated the raw total scores of the PHQ-9 for each participant and then categorised into presence/severity levels based on diagnostic scale descriptors: none (no depression), mild/moderate depression, and severe depression. The counts and percentages are presented to determine the prevalence and level of depression. The same approach was used to answer RQ3, except we used the raw scores for PHQ-9 item 9.

To answer both RQ2 and RQ4, all between-subgroup comparisons were performed using Bayesian statistics; for a detailed but accessible introduction see Kruschke.[35] The analysis was carried out within R[36] in Stan[37] via the brms package.[38] The regression model was ordinal with a cumulative-probit link function. For RQ2 and RQ4, the model for each between-subgroup comparison included a fixed effect for gender or sexuality subgroup (e.g., cisgender, nonbinary; reference level underlined), while the response variable was depression. For RQ2 only, the model was also hierarchical, as each participant responded to multiple items; in this case, random intercepts for participant and item were included. For RQ2, the response variable was depression; for RQ4, it was thoughts of self-harm or suicide. The same models were used for the sexuality-based comparisons. There were no model-convergence errors. Model fit was assessed visually using posterior predictive-checks[39]; these showed adequate fit for all models that were run in the regression analysis.

3 | RESULTS

The initial phase of our analysis is concerned with how prevalent each of the three levels of depression occurred among the participants (RQ1). Appendix Table A1 and Figure A1 show the percentage of cases at the three depression levels in the whole sample (N = 91), the gender subgroups (n = 89), and the sexuality subgroups (n = 80).[2] Overall, 45.1% GSD people experienced mild/moderate depression, 35.2% severe depression and 19.8% no depression. For the gender subgroups, 95.0% and 90.9% of trans and nonbinary subgroups (respectively) reported experiencing depression. The trans subgroup experienced the highest level of mild/moderate depression (50.0%), followed by nonbinary (45.5%) and cisgender (44.7%) subgroups. Trans and nonbinary subgroups experienced severe depression almost 1.8 times more than their cisgender counterparts (45.0% and 45.5%, respectively, vs. 25.5%). For the sexuality subgroups, 93.7%, 92.9% and 82.6% of bisexual, pansexual and queer subgroups (respectively) reported experiencing depression. Just under half of the lesbian participants reported experiencing no depression (45.5%). The bisexual subgroup experienced the highest level of mild/moderate depression (56.3%) which was three times more than the lesbian subgroup (18.2%), followed by gay (50.0%), pansexual (50.0%) and queer (47.8%) subgroups. The pansexual subgroup experienced the highest level of severe depression (42.9%), followed by bisexual, lesbian and queer subgroups (34.8% to 37.5%).

We will next explore whether some gender or sexuality subgroups in this study experienced more symptoms of depression than others (RQ2). In the analysis above, a depression level was calculated for each participant as the sum of the numerical values of their ordinal responses (e.g., 2 = 'More than half the days') to the nine items in the PHQ-9. For the between-subgroup comparisons which follow, the ordinal responses themselves will be used instead.[3] Figure 1A and Table 2 summarise these responses for the whole sample (N = 91), and also according to gender (n = 89) and sexuality (n = 80). Note, that in calculating the percentage values in this figure, we pooled together all of the responses contributed by all participants.

The results for the gender subgroups will be presented first. The participants' responses were compared within all three possible pairings of the three subgroups (e.g., nonbinary vs. cisgender). Figure 2A shows the results for the main parameter of interest (i.e., gender) for all three pairings; we have sorted these in terms of descending order of the size of the parameter estimate. We will begin with the pairings for trans vs. cisgender, and nonbinary vs. cisgender. Notice that, for the first pairing, the range of most probable values for the estimate is located to the right of zero, indicating a positive effect of trans *relative to* cisgender ($\hat{b} = 1.25$); in other words, the trans participants in our sample were experiencing higher levels of depression than their cisgender counterparts. For nonbinary versus cisgender, the effect is again positive, albeit not as large ($\hat{b} = .74$).

Interpretation of the result for trans vs. nonbinary is less straightforward. While the effect of gender is positive ($\hat{b} = .51$), only a part of the whole high-density interval (HDI) lies to the right of zero. In a case
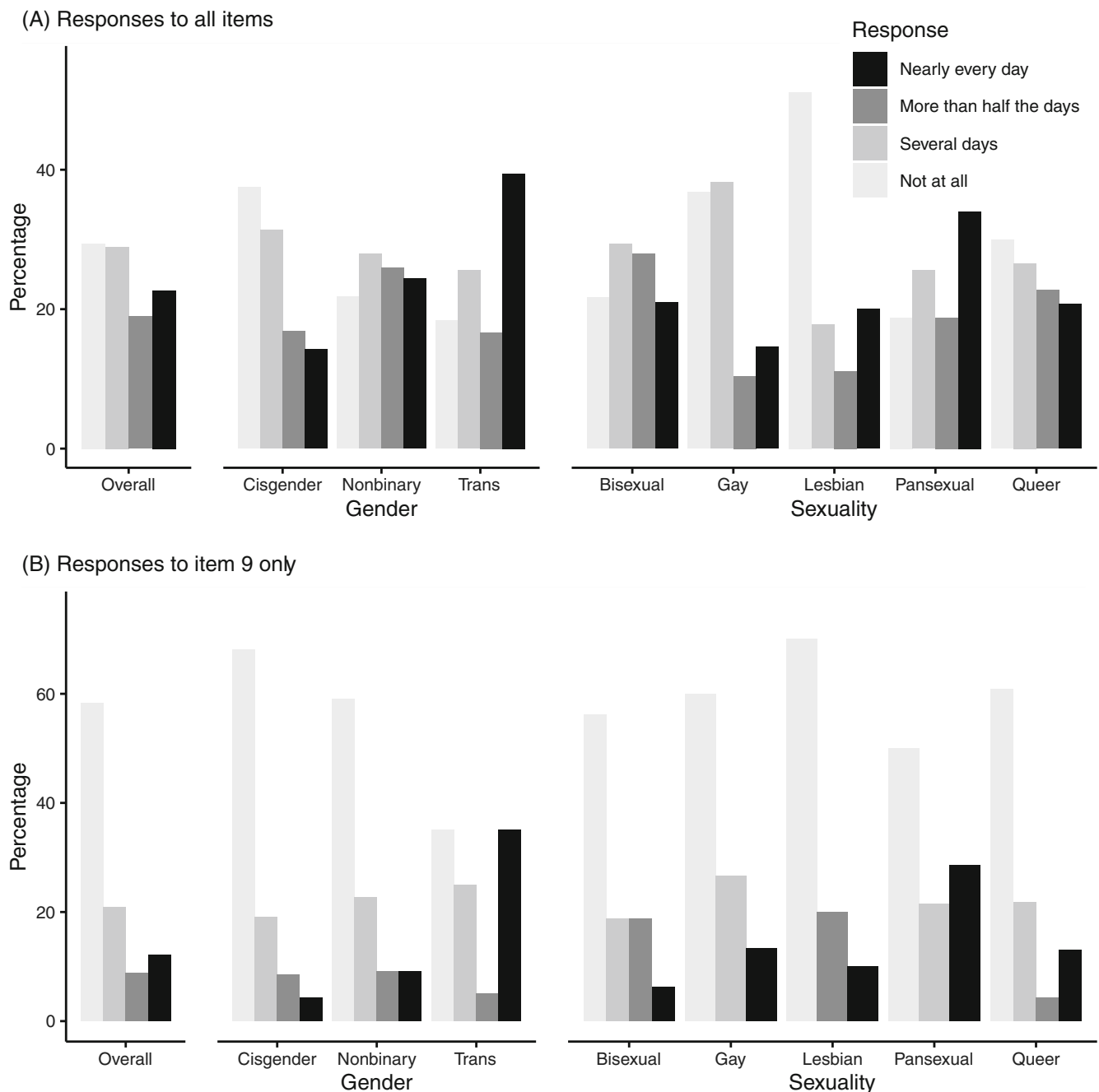
FIGURE 1 PHQ-9 responses overall and by gender and sexuality subgroups displayed as percentages.

like this, it is worth considering the probability of direction (*pd*) for the effect in question: this refers to the probability that this effect exists in the direction indicated by the sign of the parameter estimate (i.e., either negative or positive). For trans vs. nonbinary, the *pd* for a positive effect of gender is .88. Our conclusion is that there is insufficiently strong evidence for an effect of gender for this pairing. Hence, we are unable to infer with reasonable certainty that the trans people in our sample were experiencing higher levels of depression than the nonbinary people. For the full output of each between-group comparison in this study, see the Supporting information at https://osf.io/qt6n4/.

The sexuality findings will be presented next. Figure 2B shows the posterior distributions for the effect of sexuality on depression for all 10 logically possible pairings. For three pairings, we have credible evidence that an effect is present: bisexual versus lesbian ($\hat{b} = .81$, $pd = .93$), pansexual versus lesbian ($\hat{b} = 1.01$, $pd = .93$), pansexual versus gay ($\hat{b} = .86$, $pd = .92$). No effect can be claimed for any of the remaining seven comparisons.

The last phase of our analysis is concerned with how prevalent thoughts of self-harm or suicide (RQ3) was among study participants; and whether some gender subgroups (cisgender, nonbinary and trans) and sexuality subgroups (bisexual, gay, lesbian, pansexual, and queer)

TABLE 2 Levels of depression overall and by gender and sexuality subgroups.

Group	N	Not at all		Several days		More than half the days		Nearly every day	
		n	%	n	%	n	%	n	%
Overall	816	240	29.4	236	28.9	155	19.0	185	22.7
Gender	(798)								
Cisgender	421	158	37.5	132	31.4	71	16.9	60	14.3
Nonbinary	197	43	21.8	55	27.9	51	25.9	48	24.4
Trans	180	33	18.3	46	25.6	30	16.7	71	39.4
Sexuality	(717)								
Bisexual	143	31	21.7	42	29.4	40	28.0	30	21.0
Gay	144	53	36.8	55	38.2	15	10.4	21	14.6
Lesbian	90	46	51.1	16	17.8	10	11.1	18	20.0
Pansexual	133	25	18.8	34	25.6	25	18.8	49	36.8
Queer	207	62	30.0	55	26.6	47	22.7	43	20.8

Note: The data represents the pooled responses for all PHQ-9 items.

experience higher levels of thoughts of self-harm or suicide than others (RQ4). These are summarised in Figure 1B and Table 3. Overall, 41.8% GSD people experienced thoughts of self-harm or suicide in the past 2 weeks. Figure 2C presents the results for the gender subgroups. Trans participants were having thoughts of self-harm or suicide more often than the cisgender participants ($\hat{b} = .87$) or the nonbinary participants ($\hat{b} = .64$); however, there was no credible evidence for a gender effect in the remaining comparison. Lastly, the results for the sexuality subgroups are displayed in Figure 2D. No effect of sexuality was evident for any of these comparisons.

4 | DISCUSSION

The current study aimed to examine the prevalence and severity levels of depression and thoughts of self-harm or suicide among GSD people living within the regional area of Toowoomba in South-West Queensland, Australia. In response to RQ1, four out of five participants for the overall GSD group reported experiencing depression and 35.2% severe depression. Trans and nonbinary subgroups (95% and 90.9%, respectively) reported higher levels of depression than their sexually diverse cisgender counterparts (70.2%). The trans and nonbinary subgroups reported similar levels of severe depression (45% and 45.5%, respectively). While the bisexual and pansexual subgroups reported the highest levels of overall depression (mild to severe; 93.7% and 92.9%, respectively) among the sexuality subgroups; and the pansexual subgroup experienced the highest level of severe depression followed by bisexual and lesbian subgroups (42.9%, 37.5% and 36.4%, respectively). The lesbian subgroup experienced the least frequency of depression, with almost half of the participants reporting no depression. The gay sexuality subgroup experienced the least severe depression (18.8%).

Our findings are generally consistent with existing Australian research. For example, the national Australian PL3[8] survey of 6834 LGBTIQ adults found four out of five participants experienced moderate to high/very high levels of psychological distress assessed by the Kessler Psychological Distress Scale (or K10), however, high/very high distress was experienced by 57.2% which is higher than our sample. This may be explained primarily by the measurement scale as the K10, which also includes symptoms of anxiety, in addition to the difference in sample size—and is not a clinically diagnostic instrument for depression. The patterns for high/very high psychological distress among GSD subgroups were equally similar with the exception that the gay subgroup who experienced the least psychological distress followed by the lesbian subgroup. In addition, the *First Australian National Trans Mental Health Study*[40] in 2013 ($n = 946$) found 43.7% of participants experienced clinical levels of depression symptoms measured by PHQ-9. However, cross-study comparisons must be considered with caution due to possible sampling and methodological differences.

A Canadian study by Ferlatte et al.[16] with people within gender and sexual minority groups ($n = 2778$) investigated levels of depression (using PHQ-9) found 37.5% of participants reported major (severe) depression (PHQ-9 score ≥ 15) which was similar to our samples (35.2%). Consistent with our study among their gender subgroups, the nonbinary subgroup ($n = 561$) reported the highest level of major depression (55.3%), followed by trans men and trans women (49.8%, $n = 209$ and 40.2%, $n = 82$, respectively). For Ferlatte et al.[16] sexuality subgroups (partially consistent with our findings), the pansexual subgroup reported the highest frequency of major depression (51.5%) followed by queer and bisexual subgroups (42.2% and 42.1%, respectively), with the gay/lesbian subgroup less frequently experiencing major depression (25.6%). Similarly our findings revealed pansexual subgroup with the highest frequency of reported severe depression (42.9%), however, inconsistent with Ferlatte et al.[16] the lesbian subgroup reported similar levels of severe depression (36.4%) as the bisexual and queer subgroups (37.5% and 34.8%, respectively). The lower percentage of major depression among the gay/lesbian subgroup compared to our lesbian subgroup could be attributed to the larger number of participants and
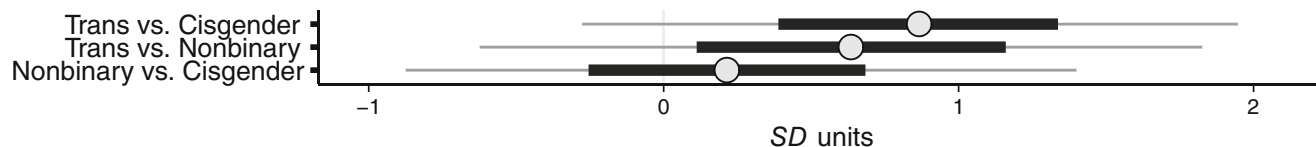
(A) Effects of gender on depression
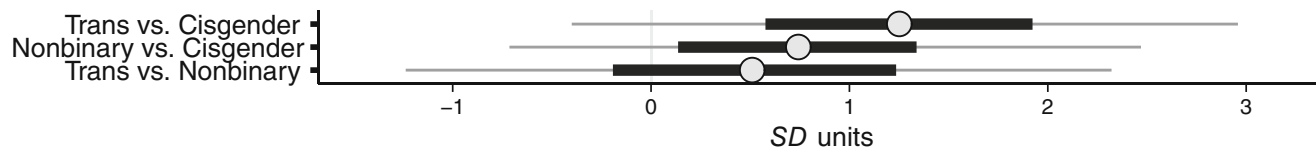
(B) Effects of sexuality on depression
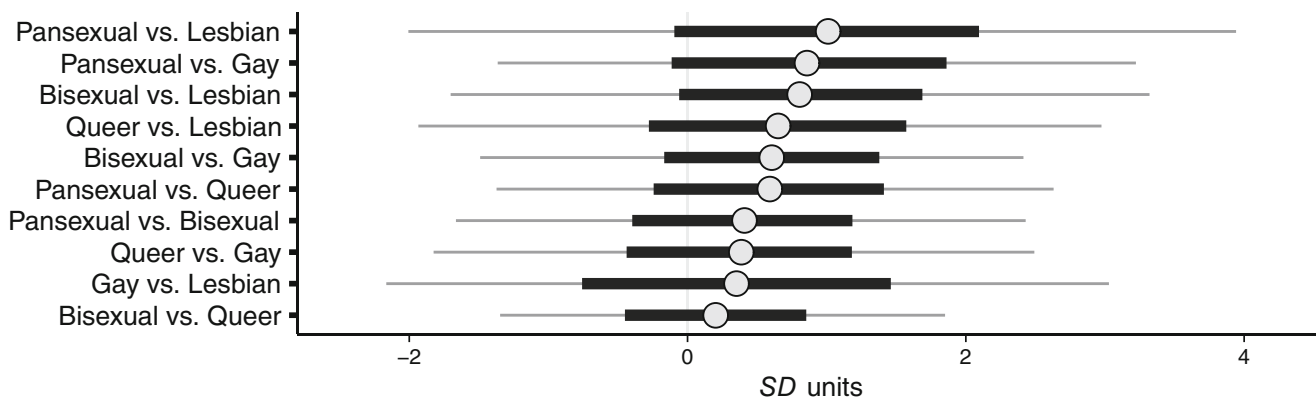
(C) Effects of gender on thoughts of self–harm or suicide

(D) Effects of sexuality on thoughts of self–harm or suicide
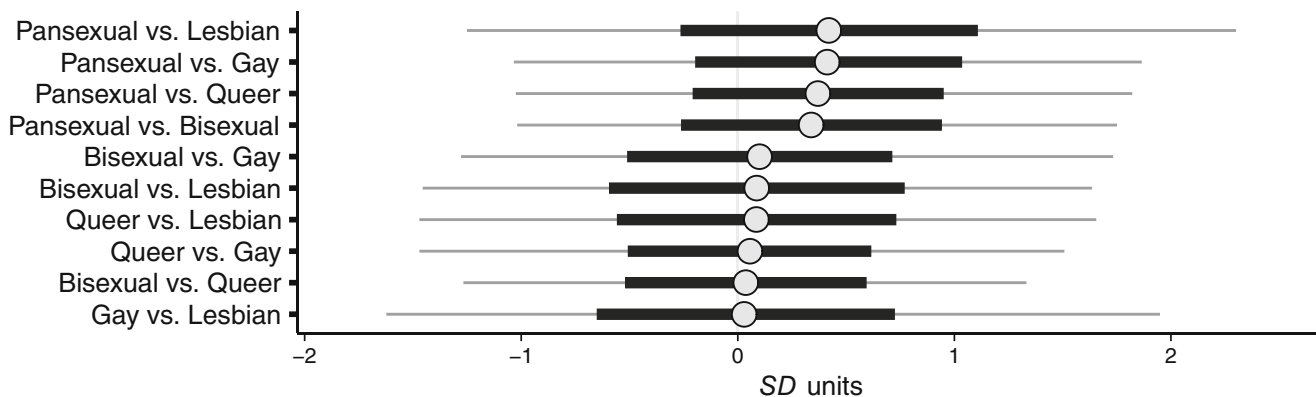
FIGURE 2 Posterior distributions for the effects of gender and sexuality on depression and on thoughts of self-harm or suicide by subgroup pairing. In each distribution, the thick line represents the 89% highest density interval (HDI): this spans the 89% most credible values for the parameter estimate ($\hat{b}$). The thin line extends over the full range of values in the posterior distribution. The estimate is the mean of these values, and is shown by a circle.

combining lesbian and gay people as one group, whereas the sample in our study was small ($n = 11$).

For RQ2, our findings indicate some GSD subgroups in the Too-woomba region experience higher levels of depression than other subgroups. In the gender subgroups, trans and nonbinary people experienced higher levels of depression than cisgender people. In the sexuality subgroups, bisexual and pansexual people experienced higher levels of depression than lesbian people, and pansexual people

higher levels of depression than gay people. Hence, for these between-subgroup comparisons, RQ2 can be answered 'yes'.

RQ3 was concerned with the prevalence of thoughts of self-harm or suicide. Over two out of five participants (41.8%) reported experiencing thoughts of self-harm or suicide in the past 2 weeks. This result is consistent with findings from the Australian *Queer Stories Online Survey*[11] of GSD young people (aged 16–27 years; $n = 1032$) which found 40.8% and 41.6% of their participants had thoughts of

TABLE 3 Levels of thoughts of self-harm or suicide overall and by gender and sexuality subgroups (N = 91).

Group	N	Not at all		Several days		More than half the days		Nearly every day	
		n	%	n	%	n	%	n	%
Overall	91	53	58.2	19	20.9	8	8.8	11	12.1
Gender	(89)								
Cisgender	47	32	68.1	9	19.2	4	8.5	2	4.3
Nonbinary	22	13	59.1	5	22.7	2	9.1	2	9.1
Trans	20	7	35.0	5	25.0	1	5.0	7	35.0
Sexuality	(78)								
Bisexual	16	9	56.3	3	18.8	3	18.8	1	6.3
Gay	15	9	60.0	4	26.7	0	.0	2	13.3
Lesbian	10	7	70.0	0	0.0	2	20.0	1	10.0
Pansexual	14	7	50.0	3	21.4	0	.0	4	28.6
Queer	23	14	60.9	5	21.7	1	4.4	3	13.0

self-harm and suicide (respectively). Furthermore, the PL3 survey[8] found 41.9% (n = 2848) of participants reported thoughts of suicide in the past 12 months. Related to RQ4, our analysis revealed that among the gender subgroups, trans people experience higher levels of thoughts of self-harm or suicide than cisgender or nonbinary people (65% vs. 31.9% and 40.9%, respectively). The *First Australian National Trans Mental Health Study*[40] found 41% (n = 387) of trans participants reported experiencing thoughts of self-harm or suicide in the past 2 weeks. Furthermore, an Australian and New Zealand study by Treharne et al.[41] found 40.1% (n = 161) of trans participants reported recent (past month) suicidal ideation. These comparisons suggest trans people in the Toowoomba region experience higher rates of self-harm or suicide thoughts, however, caution should be applied due to differences in sample size. For the sexuality subgroups the results were inconclusive, although the pansexual subgroup reported the highest level of thoughts of self-harm or suicide (50%, n = 7; see Table 3).

Findings from the current study revealed relatively high levels and prevalence of clinically significant depressive symptoms and self-harm/suicide ideation in this cohort are reflective of Minority Stress Theory[13,14] and the Psychological Mediation Framework.[15] Although specific constructs within these models were not tested in the current study, main findings are indicative of likely cumulative and synergistic contributions of distal stigma-related stressors (e.g., prejudice, discrimination), general psychological processes (e.g., coping, emotion regulation) and group-specific processes (e.g., rejection) and the interactions between these disproportionately affect poorer mental health outcomes through psychological mechanisms such as metacognition, internalised stigma, shame and rumination (see[14,42,43]). These issues are even more pronounced for those affected by intersectional forms of oppression (see[44,45]), and these factors directly and indirectly impact poorer mental health. Being part of the GSD community in terms of both community connectedness and pride can serve as both protective and risk factors and are not mutually exclusive. These negative experiences, including monosexism, and increased demands on coping mechanisms are related to repeated experiences of discrimination and fragmentation within the GSD community which may be

heightened among trans, nonbinary, pansexual and bisexual people as compared to gay and lesbian people.[1,46–48] Many people from GSD priority subgroups (such as those identifying as bisexual or pansexual) report rejection and exclusion from within the rainbow community—in addition to from wider society which can further exacerbate poorer mental health.[49] Greater barriers are also faced in accessing mainstream health services in regional and rural areas—particularly among GSD people which further supports the need for innovative health solutions to increase acceptability and uptake within Australia (e.g., peer-support, mobile/regional outreach; see[50]).

Implications of these findings are relevant in terms of the need to heighten awareness of mental health risks and, in particular, for GSD subgroups and foster greater cohesion within the GSD community. It is also important to enhance the training and capacity and capability of health and helping professionals regarding their role in supporting prevention and tailored treatment efforts and overcoming implicit bias—including support for those living with multiple interconnected identities.[45] Moreover, to address structural barriers that contribute to better/poorer mental health outcomes in GSD priority subgroups (e.g., gender affirming surgery for trans and nonbinary people; see[51]), specifically among regional and rural communities where resources are limited. Further research is also recommended to better examine components of The Minority Stress Theory and The Psychological Mediation Framework and how key constructs may uniquely impact upon the wellbeing of members of GSD priority subgroups and how these models may inform health promotion campaigns and practices.

5 | LIMITATIONS

We analysed data that were drawn from a convenience sample from the Toowoomba region, therefore, generalisations of the findings beyond this region are limited. The current study does not include nor control for other potentially contributing factors (e.g., discrimination; harassment; housing/homelessness; domestic, family and intimate partner violence; health and support service engagement) which could

be explored more in depth in future research—particularly regarding possible causal associations. This study may also be limited by self-report biases—and may have disproportionately attracted those who are more interested in the topic/s or have greater GSD community affiliation (based on recruitment strategies). Nevertheless, our aim was to specifically investigate depression symptoms within the targeted population. It is noted there were an insufficient number of Aboriginal and Torres Strait Islander Peoples who responded to the survey for an analysis investigating disparities within this subgroup to be conducted. Future research should aim to enhance recruitment methods among GSD Aboriginal and Torres Strait Islander Peoples. The cross-sectional design of the survey does not allow for determination of causality for depression symptoms experienced by participants. We recommend future research focus on methods to enhance recruitment of larger, more representative samples. A further limitation of our study is that the sample is relatively small. However, simulation studies have demonstrated Bayesian methods deal more effectively with this problem than the frequentist approach (see[52] and studies cited therein). It is noted, in most instances, caution must be exercised when comparing our findings with those of previous studies, as the Bayesian approach is not adopted as widely as the frequentist one. However, results of a recent systematic review indicate that Bayesian methods are being employed increasingly often within psychology.[53]

6 | CONCLUSION

Given the disproportionately high and concerning prevalence and severity of depression and suicidal/self-harm ideation elucidated in the current study—there remains an urgent call to action to ensure we uphold the United Nations Sustainable Development Group[54] directive to 'leave no one behind' in terms of enhancing factors associated with mental health and mitigating risk factors at individual, GSD community and wider society levels. Given the even greater health disparities highlighted among GSD priority subgroups in this study, notably pansexual and bisexual people, further work is needed both in research efforts and regarding clinical applications to better understand and address unique challenges/needs of members of these subgroups and rectify contributing factors in order to promote optimal mental health for all.

CONFLICT OF INTEREST STATEMENT
The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ETHICS STATEMENT
Ethics approval was granted by the University of Southern Queensland's Human Research Ethics Committee: (Approval number H21REA146).

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ENDNOTES
[1] Two participants did not state their ages and were excluded from this calculation.

[2] In order to calculate the depression level for any given participant, a full set of responses to the nine PHQ-9 items for that participant was required. However, three of the 91 participants omitted one survey response each: there were two omissions for item 6, and one for item 8. (Note that the data for item 9 was not affected; cf. RQ3.) In order to calculate the levels for these three participants, we used multiple imputation to insert plausible values for the three responses that they omitted. This was done using the mice package in R (van Buuren S, Groothuis-Oudshoorn K. mice: Multivariate Imputation by Chained Equations in R [Internet]. Vol. 45, *Journal of Statistical Software*. 2011. p. 1–67. Available from: https://www.jstatsoft.org/v45/i03/). As explained above, it was possible to use all 91 participants when *overall* levels of depression were calculated. However, some participants had to be excluded when these levels were calculated by gender or sexuality grouping. See Section 2.1 for more information. (Multiple imputation of categorical variables is problematic, and may even yield less satisfactory results than listwise deletion [Ilison PD. Imputation of categorical variables with PROC MI. Available from: https://support.sas.com/resources/papers/proceedings/proceedings/sugi30/113-30.pdf].)

[3] In answering RQ2, we opted not to use multiple imputation to insert plausible values for the three omitted PHQ-9 responses (cf. footnote 1). Hierarchical regression is able to deal well with missing data, especially when this procedure is implemented within the Bayesian framework (Field A, Miles J, Field Z. Discovering statistics using R. London: Sage; 2012; Gelman A, Carlin J, Stern H, Dunson D, Vehtari A., Rubin D. *Bayesian data analysis*. 3rd ed. Boca Raton, Fla.: Chapman and Hall/CRC; 2014).

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APPENDIX A

TABLE A1 Levels of depression overall and by gender and sexuality subgroup (N = 88).

Group	N	None n	None %	Mild/moderate n	Mild/moderate %	Severe n	Severe %
Overall	91	18	19.8	41	45.1	32	35.2
Gender	(89)						
Cisgender	47	14	29.8	21	44.7	12	25.5
Nonbinary	22	2	9.1	10	45.5	10	45.5
Trans	20	1	5.0	10	50.0	9	45.0
Sexuality	(80)						
Bisexual	16	1	6.3	9	56.3	6	37.5
Gay	16	5	31.3	8	50.0	3	18.8
Lesbian	11	5	45.5	2	18.2	4	36.4
Pansexual	14	1	7.1	7	50.0	6	42.9
Queer	23	4	17.4	11	47.8	8	34.8

Note: Two participants had missing responses to gender/sexuality questionnaire items and 11 participants reported their gender or sexuality as either not listed, asexual, heterosexual or something else; therefore, we were unable to calculate depression levels for these individuals within the subgroups.

TABLE A2 Patient Health Questionnaire (PHQ-9) items.

Item	Question
1	Little pleasure or little interest in doing things
2	Feeling down, depressed, or hopeless
3	Trouble falling or staying asleep, or sleeping too much
4	Having little energy or feeling tired
5	Poor appetite or overeating
6	Feeling negative about yourself, or that you are a failure or have let yourself or your family down
7	Trouble concentrating on things, such as reading the news or watching television
8	Moving or talking so slowly that other people could have noticed? Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual
9	Thoughts that you would be better off dead or of hurting yourself in some way

TABLE A3 Survey gender and sexuality questions and response options.

Item	Question
Q6	In your own words, describe your gender: --------------------
Q7	Which of the following best describes your gender? *Select all that apply, even if the same as what you have written above.* ☐ Trans ☐ Cisgender Woman/Female (non-trans) ☐ Trans woman ☐ Cisgender Man/Male (non-trans) ☐ Trans man ☐ Pangender ☐ Sistergirl ☐ Genderqueer ☐ Brotherboy ☐ Genderfluid ☐ Non-binary ☐ Gender Non-conforming ☐ Agender ☐ Not listed
Q9	Which of the following best describes your sexual orientation? *Select all that apply.* ☐ Lesbian ☐ Pansexual ☐ Gay ☐ Queer ☐ Heterosexual ☐ Asexual ☐ Bisexual ☐ Aromantic ☐ Something else (please specify) _____

FIGURE A1 Levels of depression overall and by gender and sexuality subgroups displayed as percentages.