Journal of Affective Disorders 353 (2024) 52–59

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research paper

Suicidal ideation risk among LGB Spanish university students: The role of childhood and adolescence adversities and mental disorders

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ABSTRACT

Background: Childhood/adolescence adversities and mental disorders are higher among LGB youths.
Aims: To evaluate the role of childhood maltreatment, bullying, and mental disorders on the association between sexual orientation and suicidal ideation (SI); and the role of mental disorders on the association between sexual orientation discrimination and SI.
Methods: Baseline and 12-month follow-up online surveys of Spanish first-year university students (18–24-year-olds). Multivariable logistic regression models assessed the effects of childhood/adolescence adversities and mental disorders in the relationship between sexual orientation, discrimination and SI.
Results: A total of 1224 students were included (16.4 % LGBs). Risk factors of lifetime SI were sexual orientation (OR 2.4), any bullying (OR 2.4), any childhood maltreatment (OR 4.0), and any mental disorders (OR 3.8). Final model Area Under the Curve (AUC) 0.78. Among homosexual and bisexual students, discrimination showed increased risk of 12-month SI (OR 2.2), but this effect was no longer statistically significant when any 12-month mental disorder was added (OR 7.8). Final model AUC 0.72.
Limitations: Sample of interest was relatively small. But it was similar to comparable studies and statistical adjustments have been performed. Assessment of mental disorders and SI was not based on clinical assessment. However, validated scales showing good diagnostic agreement with clinical judgement were used.
Conclusions: Childhood/adolescence adversities and mental disorders interact in the association between sexual orientation and SI. Mental disorders may mediate the association between sexual orientation discrimination and SI. Further research using larger samples and causal modelling approach assessing the mediators of SI risk among LGBs is needed.

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https://doi.org/10.1016/j.jad.2024.02.084
Received 23 November 2023; Received in revised form 21 February 2024; Accepted 23 February 2024
Available online 27 February 2024

1. Introduction

Suicide is the second leading cause of death among emerging adults. Suicidal thoughts and behaviours (STB) are highly prevalent among sexual minority (Lesbian, Gay and Bisexual - LGB) emerging adults (Rimes et al., 2019), who have a two-fold risk of suicide attempt compared to heterosexuals, and risk is similar across sexes (Miranda-Mendizabal et al., 2017). Among LGB youths, university students are a vulnerable group for STB. Data from 8 high-income countries showed that LGB freshmen have a three times higher risk of STB compared to heterosexuals (Mortier et al., 2018).

The minority stress model (Meyer, 2003) explains the impact of distal and proximal stressors which create an environment that substantially increases the risk of unhealthy behaviours (Russell and Ryan, 2011) among LGBs, including mental disorders (McLaughlin et al., 2010) and STB (Marshal et al., 2011; Mortier et al., 2018). Overlapping risk characteristics (age, minority status) seem to increase the vulnerability for STB among LGB youths. Moreover, LGB youths are more exposed to stigma, discrimination and victimisation (McLaughlin et al., 2012). Specifically, childhood maltreatment ranged from 7.9 % (physical/neglect) to 12.7 % (emotional abuse) (Sterzing et al., 2016). These figures are higher than those found in comparable samples of heterosexuals. In addition, poly-victimisation (e.g. 10 or more adverse events) is almost twice as much prevalent among LGBs (Sterzing et al., 2019). Childhood maltreatment is associated to increased onset of a wide range of mental disorders (Kuzminskaite et al., 2021), as well as increased risk of suicidal ideation and attempt (Castellví et al., 2016; Falgares et al., 2018).In particular, with the onset and persistence of STB during adolescence, even when controlling for lifetime mental disorders (Bruffaerts et al., 2010). This suggests that mental disorders could mediate the association between childhood maltreatment and STB, or that childhood maltreatment may confound the relationship between mental disorders and STB.

In Spain, there is lack of data about mental health and the risk of STB among LGB youths. Health-related quality of life has been evaluated among LGB individuals, but neither specifically among youths nor university students (Marti-Pastor et al., 2018). The available data of university students is mostly confined to sexual behaviours (Castro, 2016), while there is no data about minority stress risk factors or childhood and adolescence adversities among LGB Spanish university students.

This study aims to determine the prevalence and risk of mental disorders and STB among LGB Spanish university students, according to sexual orientation. It also aims to evaluate the role of childhood and adolescence adversities (maltreatment, bullying) and mental disorders on the relationship between sexual orientation and suicidal ideation. Additionally, it assesses the role of mental disorders on the relationship between perceived sexual orientation discrimination and suicidal ideation.

2. Methods

2.1. Study design

Longitudinal observational online survey study of first year Spanish university students (baseline, T1: October 2014 and 12-month follow-up, T2: October 2015), as part of the University and Mental Health study (UNIVERSAL). This study is part of the World Mental Health International College Student Initiative (WMH-ICS). Detailed description of the UNIVERSAL study is available in prior publication (Blasco et al., 2016).

2.2. Sample and setting

Five public universities from Spain: Balearic Islands University (UIB), Basque Country University (UPV-EHU), Cádiz University (UCA), Miguel Hernández University (UMH) and Pompeu Fabra University (UPF) participated in this study. Universities were recruited on a convenience basis, but reflecting a wide geographic variation of the country. They represented about 8.2 % of all students enrolled in public Spanish universities during 2014–15. Their overall distribution in terms of sex, study field and percentage of foreign students was similar to that of the overall population of students in Spanish public universities (Ballester et al., 2020).

All freshmen students aged 18 to 24 and enrolled in the participating universities for the first time were eligible for the study (subjects under 18 at the beginning of the academic year were eligible when they turned 18). Based on eligibility criteria, 16332 students were suitable to participate.

Sample recruitment was performed in two stages. First, all eligible students were invited to participate. Invitation methods included campus advertising campaigns and, in some universities, up to four personal e-mail invitations. Eligible students had to register to the survey and provide their informed consent before receiving a personalised link and password to access the baseline survey (T1). Second, a random subsample of non-respondents to the baseline survey was contacted by e-mail, including an economic incentive (25 €) to complete the survey ("endgame strategy"). In UPV-EHU, only first stage was carried out. A total of 2343 students registered for the baseline survey. Only 2118 completed the 100 % of the survey. Twelve months after completion of the baseline interview, respondents were contacted via e-mail with a link to complete the first follow-up survey (T2). A raffle of academic materials (40 €) among all students who completed follow-up survey was carried out. Final follow-up sample was 1248. More information about the sample has been published elsewhere (Blasco et al., 2019). The study protocol was approved by the Parc de Salut Mar-Clinical Research Ethics Committee *(Reference number 2013/525/I)*.

2.3. Variables

2.3.1. Suicidal thoughts and behaviours (STB)

At T1, lifetime and 12-month STB were assessed through ideation *("Have you ever had thoughts of killing yourself?")*, plans *("Did you ever think about how you might kill yourself or work out a plan of how to kill yourself?")* or attempts *("Did you ever make a suicide attempt (e.g., purposefully hurt yourself with at least some intent to die)?")*; from modified versions of the Self-Injurious Thoughts and Behaviours Interview (SITBI) (Nock et al., 2007) and Columbia-Suicide Severity Rating Scale (C-SSRS) (Posner et al., 2007). At T2, respondents were presented an equivalent series of questions with regard to the previous 12-month.

2.3.2. Mental disorders

Probable cases of lifetime and 12-month mental disorders were assessed at T1, and 12-month mental disorders were also evaluated at T2. The mental disorders assessment included mood disorders (major depressive and/or bipolar disorder), anxiety disorder (panic and/or generalised anxiety disorder) and alcohol/substance disorder (abuse or dependence). Items from the Composite International Diagnostic Interview Screening scale 3.0 (CIDI 3.0) (Kessler and Ustün, 2004) and a modified version of the Alcohol Use Disorders Identification Test, 10-item version (AUDIT-10) (Saunders et al., 1993) were used. To control the validity of the research, a clinical re-appraisal study was carried out, indicating a good concordance with self-reported data results (Ballester et al., 2019).

2.3.3. Sexual orientation

Answers from T1 survey to the question *"Which is your sexual orientation?"* were used, with the following response options: *"Heterosexual"*, *"Gay/lesbian"*, *"Bisexual"*, *"Asexual"*, *"I am not sure"*, *"Other (open answer)"* and *"I prefer not to answer"*.

2.3.4. Perceived sexual orientation discrimination

In the follow-up survey, homosexual and bisexual participants

answered the Multiple Discrimination Scale (MDS) (9-items), which assesses behavioural expressions of prejudice in the past 12-month, including interpersonal, institutional and violent discrimination related to sexual orientation (McKirnan and Peterson, 1988). The MDS has obtained evidence of validity and reliability (Bogart et al., 2013). Furthermore, some items have been previously used to assess other kinds of discrimination (Brondolo et al., 2006; Krieger and Sidney, 2005).

2.3.5. Childhood maltreatment and bullying

Childhood maltreatment, prior to the age of 17, was assessed with 8-items including emotional maltreatment, physical/sexual abuse and neglect (e.g., *"Someone in your family repeatedly said hurtful or insulting things to you"*). Four items assessed physical and verbal bullying, and cyberbullying. Items were adapted from the CIDI 3.0 (Kessler and Ustün, 2004), the Adverse Childhood Experiences Scale (Felitti et al., 1998) and the Bully Survey (Swearer and Cary, 2003).

2.3.6. Socio-demographic

Age, gender, university, academic field, country of birth, parents' educational level and living location at first term (parents' home or others) were evaluated.

2.4. Analysis

Missing item-level data among respondents were imputed using multiple imputation (MI) by chained equations with 43 imputed datasets, equivalent to the percentage of incomplete subjects, and 10 iterations per imputation. To correct the bias caused by lost to follow up missing values, inverse-probability weighting was applied, calculated as the inverse of the estimated probability of completing T2 survey on observed related covariates assessed at T1, using a logistic regression model. Additionally, post-stratification weights were used to restore population distribution and to match the final sample ($n = 1224$) to the target population of 16332 students according to gender, country of birth, academic field and university; and to the full sample of baseline participants ($n = 2118$) according to baseline characteristics (further details available upon request). All percentages presented in this article are weighted percentages. Descriptive analyses estimated lifetime and 12-month prevalence of mental disorders (mood disorder, anxiety disorder and alcohol/substance disorder [abuse or dependence]) and of suicidal ideation (SI), plan and attempt, stratified by sexual orientation. Lifetime prevalence corresponded to lifetime or 12-month positive screening mental disorders, SI, plan and attempt at T1. Twelve-month prevalence corresponded to the positive screening mental disorders, SI, plan and attempt at 12-month at T2. Multivariable logistic regression models, adjusted by age, gender, country of origin, university, academic field, parents' university studies and living at first term, investigated the odds for mental disorders and SI for LGB students. Logistic models were estimated adding one explanatory variable at a time to compare the contribution of each of them to lifetime any mental disorder and SI. For lifetime SI, we evaluated 3 models: Model I included only sexual minority; Model II added any bullying and any childhood maltreatment; and Model III tested the role of any lifetime mental disorder. Among youths self-identified as homosexual and bisexual respondents, the contribution of 12-month perceived sexual orientation discrimination, lifetime mental disorder or SI at T1 and 12-month any mental disorder to the risk for 12-month SI was assessed through: Model I included perceived discrimination; Model II adding lifetime mental disorder or SI at T1; and Model III adding 12-month any mental disorder.

Adjusted odds ratios (aORs) and MI-based CIs were obtained. Statistical significance was evaluated with two-sided F test based on MI with significance level α set at 0.05. The area under the curve (AUC) was estimated to assess the discriminant capacity of the models using leave one out cross-validation. Due to low numbers of the STB outcomes assessed, only SI could be assessed in the models. Categories with a very low number of observations ($n < 10$), which included transgender ($n = 8$) and asexual ($n = 9$), were excluded for the analysis. SAS software version 9.4 and R version 3.4.2 were used. MI were carried out using package mice from R.

3. Results

From the total follow-up sample ($n = 1248$), 24 individuals were excluded for these analyses because information about sexual orientation was not available. Therefore, final sample considered was 1224 individuals. Lesbian, Gay and Bisexual (LGB) students represented 16.4 % of the weighted sample. Around 5 % of the students reported being homosexual while the majority indicated being bisexual or unsure about their sexual orientation. Almost 79 % of homosexual students were male, and more than half of both bisexual and unsure students were female. Twenty-four percent of heterosexual respondents reported some sort of childhood maltreatment. Prevalence of any childhood maltreatment ranged from 35.1 % (homosexual respondents) to 59.7 % (asexual/other), emotional maltreatment being the most common maltreatment (from 22.2 % among unsure respondents to 56.3 % among asexual/other). The most common form of bullying among LGBs was the verbal form (from 27.2 % among asexual/othe to 69.9 % among homosexual respondents) (Table 1).

In the previous 12 months, 16 % of homosexual students were insulted or made fun of by somebody due to their sexual orientation; similarly, this happened to 7.1 % of bisexual students. Almost 12 % of homosexual and 14 % of bisexual students were treated with hostility or coldness by strangers due to their sexual orientation. The 9.3 % and 5.7 % of homosexual and bisexual students, respectively, were ignored, excluded, or avoided by close people. Nobody reported discrimination in the health services (Table S1).

Bisexual students showed elevated odds of lifetime (aOR 4.7) and 12-month (aOR 2.8) mood disorder (*p-value* < 0.0001) as did LGB-unsure students (Lifetime: aOR 2.1; 12-month: aOR 2.2) (*p-value* < 0.0001) (Table 2). The odds of lifetime and 12-month alcohol/substance disorder were more than twice as higher among bisexual students than among heterosexuals (Lifetime: aOR 2.7; 12-month aOR 2.8) (*p-value* < 0.0001). Odds of any lifetime mental disorder was higher among unsure (aOR 2.1) and bisexual (aOR 4.1) students (*p-value* < 0.0001). For the latter, 12-month odds of any mental disorder was also higher (aOR 3.0) (*p-value* 0.001). LGB students had more than two-fold odds of lifetime SI (Homosexual aOR 2.4; Bisexual aOR 3.4; Unsure aOR 3.5) (*p-value* < 0.0001). Results of 12-month SI were similarly higher, but only for bisexual (aOR 3.9) and unsure (aOR 2.8) students (*p-value* < 0.0001). Increased odds of lifetime suicide attempt were observed for homosexual (aOR 6.1) and unsure (aOR 5.1) students (*p-value* 0.035) (Table 2).

Multiple logistic regression Model I showed an association between any sexual minority (lesbian, gay or bisexual) and lifetime SI (aOR 3.3; 95%CI 2.3–4.6) (*p-value* < 0.0001). Model II added any bullying (aOR 2.6; 95%CI 1.9–3.5) and any childhood maltreatment (aOR 4.6; 95%CI 3.3–6.2) (*p-value* < 0.0001), both showed higher odds for lifetime SI, while the association observed for any sexual minority was slightly attenuated (aOR 2.4; 95%CI 1.6–3.5). When any lifetime mental disorder was added to the analysis (Model III), the association between any sexual minority and SI remained similar, whereas the risk effects of any bullying (aOR 2.4; 95%CI 1.7–3.3) and any childhood maltreatment (aOR 4.0; 95%CI 2.9–5.5) (*p-value* < 0.0001) became somewhat attenuated. The area under the curve (AUC) obtained was 0.62 for Model I, 0.75 for Model II, and 0.78 for Model III (Table 3).

For homosexual and bisexual students, we found increased odds for 12-month SI associated to perceived discrimination due to sexual orientation (aOR 3.9; 95%CI 1.2–12.9) (*p-value* < 0.05); (Model I). When lifetime mental disorder or SI (T1) (aOR 3.4; 95%CI 0.6–17.7) (*p-value* 0.152) and any 12-month mental disorder (aOR 7.8; 95%CI 1.1–50.4) (*p-value* 0.0356) were added, the risk effect of perceived discrimination decreased somewhat and it was no longer statistically

Table 1
Characteristics of Spanish university students included in the analysis, according to sexual orientation (absolute numbers and weighted proportions). The UNIVERSAL (University and Mental Health) study ($n = 1224$).

		Heterosexual $n = 1029$		Homosexual (Gay/Lesbian) $n = 43$		Bisexual $n = 70$		Unsure $n = 73$		Asexual/other n = 9		Total n = 1224	
		n	%	n	%	n	%	n	%	n	%	n	%
Age	18 years-old	764	67·9	31	58·4	48	65	61	86·3	5	41·5	909	68·2
	>18 years-old	265	32·1	12	41·6	22	35	12	13·7	4	58·5	315	31·8
Gender	Female	788	57·2	15	21·3	58	62·7	51	54	9	100	921	55·8
	Male	235	42·4	28	78·7	12	37·3	20	44·4	–	–	295	43·8
	Transgender	6	0·4	–	–	–	–	2	1·6	–	–	8	0·4
Centre	Basque Country University (UPV-EHU)	329	40·5	12	49·1	27	63·1	39	69·9	3	44·8	410	43·8
	Pompeu Fabra University (UPF)	301	13·4	16	18·2	22	12·3	22	13·5	2	7·7	363	13·6
	Balearic Islands University (UIB)	151	13·8	8	12·3	5	4·7	2	2·7	–	–	166	12·5
	Cadiz University (UCA)	132	21·6	5	13·7	5	4·1	2	5·6	3	40·6	147	19·5
	Miguel Hernandez University (UMH)	116	10·7	2	6·8	11	15·8	8	8·3	1	6·9	138	10·6
Academic field	Arts and Humanities	112	8·2	7	13·6	13	13·4	10	21·4	3	16·4	145	9·5
	Science	96	8·1	6	17·6	5	4·6	10	9·2	–	–	117	8·4
	Health Sciences	286	16	7	7·7	16	13·1	20	18·6	2	10·8	331	15·5
	Social and Legal Sciences	399	47·9	21	54·8	27	49·4	26	38·8	3	54·6	476	47·9
	Engineering and Architecture	136	19·8	2	6·3	9	19·5	7	12	1	18·2	155	18·6
Country of birth	Spain	957	95·5	39	93·6	61	86·9	69	97·5	9	100	1135	95·2
	Non Spain	72	4·5	4	6·4	9	13·1	4	2·5	–	–	89	4·8
Parents' university studies	At least one	502	45·5	13	22·9	33	48·2	30	29·1	5	41	583	43·5
	Neither	527	54·5	30	77·1	37	51·8	43	70·9	4	59	641	56·5
Living at first term	Parents' home	590	57·7	25	67·4	44	61·1	45	62·2	7	62·3	711	58·7
	Other	439	42·3	18	32·6	26	38·9	28	37·8	2	37·7	513	41·3
Childhood maltreatment	Emotional	205	18	12	31	23	29·3	19	22·2	3	56·3	262	19·7
	Physical	93	8·1	6	11·2	14	25·1	11	18·6	3	56·3	127	10·1
	Sexual	11	1	1	0·6	3	6·7	2	2·2	–	–	17	1·3
	Neglect	59	6	6	10·7	8	14·9	13	20	1	3·4	87	7·4
	Any	206	24·4	15	35·1	28	45·2	30	43·5	4	59·7	337	27·3
Bully victimisation	Physical	54	5·4	6	18·4	9	13·5	3	5	–	–	72	6·4
	Verbal	304	27·7	24	69·9	33	51·1	27	34·6	5	27·2	393	31·4
	Cyber	25	2·2	2	8	8	11	2	4·3	–	–	37	3
	Any	310	28·6	24	69·9	33	51·1	27	34·6	5	27·2	400	32·1
Mental disorders[a]													
Mood	Lifetime	358	31·5	19	28·7	44	66·3	38	48·5	3	40·2	462	34·2
	12-month	173	16·6	12	18·6	28	33	21	28·9	3	40·2	273	18·4
Anxiety	Lifetime	304	26·2	14	18·5	25	37	24	32·5	4	49·1	372	26·9
	12-month	166	15	9	12·3	17	23	13	16	3	30·4	208	15·4
Alcohol or substance	Lifetime	246	27·4	15	28·9	30	53·5	28	37	4	45·4	324	29·5
	12-month	220	24·8	13	21·9	18	32·2	26	33·7	4	45·4	291	26·6
Any mental disorder	Lifetime	575	55·1	26	44·6	57	83·8	49	71·4	6	72·7	713	57·1
	12-month	393	39·8	21	36·2	46	67·4	38	49·5	6	72·7	504	41·8
Suicidal thoughts and behaviours													
Ideation	Lifetime	239	20·6	21	39·2	41	48·8	38	49·1	5	63·6	344	24·9
	12-month	66	5·7	7	7	16	18·1	15	13·4	4	59·7	108	7·2
Plan	Lifetime	135	12·9	15	34·4	31	32·6	21	25·1	5	63·6	207	16
	12-month	39	3·4	4	4·7	7	7·4	8	7·5	4	59·7	62	4·3
Attempt	Lifetime	16	1·1	3	3·6	3	3·7	4	4·2	–	–	26	1·5
	12-month	2	0·3	1	1	–	–	2	1·2	–	–	5	0·3

[a] **Mood** includes major depression or bipolar disorder; **Anxiety** includes panic disorder or generalised anxiety disorder; **Alcohol or substance** includes abuse or dependence.

significant (Model III). However, the magnitude of perceived discrimination effect was still high (aOR 2.2; 95%CI 0.6–8.3). The area under the curve (AUC) obtained was 0.65 for Model I and 0.72 for Model III (Table 4).

4. Discussion

This study describes the association of childhood and adolescence adversities, perceived sexual orientation discrimination, and mental disorders with the risk of SI among university students. Our results show that Lesbian, Gay and Bisexual (LGB) students and those unsure about their sexual orientation have increased risk of STB. For unsure and for bisexual students, the odds of any mental disorder is also higher. Our study also shows that childhood maltreatment, bullying and mental disorders importantly increase the odds of SI among LGB students. Specifically, among homosexual and bisexual Spanish university students, sexual orientation discrimination increases the odds of SI but this effect is no longer significant when mental disorders are considered. This suggests that a substantial part of the effect could be mediated by mental disorders. Although there is a considerable effect, the lack of statistical significance suggests a lack of potency, probably due to the small size of the subsample included combined with the low prevalence of SI. This study fills a knowledge gap on mental disorders and STB among LGB Spanish and European university students. However, further research using causal modelling approach is needed to clarify the direct and indirect contributions of sexual orientation discrimination and mental disorders.

4.1. Increased STB and mental disorders among LGB Spanish university students

Consistent with previous research (Hottes et al., 2016; Mortier et al., 2018), STB among LGB Spanish university students is much higher than for heterosexual people. A higher odd for mental disorders was also

Table 2
Risk of mental disorders and suicidal thoughts and behaviours among LGB Spanish university students. The UNIVERSAL (University and Mental Health) study (n = 1207).

		Homosexual (Gay/Lesbian)[a]		Bisexual[a]		Unsure[a]		*p-value*
		OR[b]	95 % CI	OR[b]	95 % CI	OR[b]	95 % CI	
Mental disorders[c]								
Mood	Lifetime	0·9	0·5–1·7	**4·7**	**2·6–8·3**	**2·1**	**1·3–3·6**	**<0·0001**
	12-month	1·2	0·6–2·3	**2·8**	**1·5–5·2**	**2·2**	**1·3–4·0**	**<0·0001**
Anxiety	Lifetime	0·8	0·4–1·6	1·5	0·8–2·7	1·4	0·8–2·5	0·362
	12-month	0·9	0·4–2·1	1·5	0·8–2·8	1	0·5–2·1	0·730
Alcohol or substance	Lifetime	0·9	0·5–1·6	**2·7**	**1·6–4·7**	1·5	0·9–2·6	**0·002**
	12-month	0·6	0·3–1·3	**2·8**	**1·6–4·8**	1·4	0·8–2·5	**<0·0001**
Any mental disorder	Lifetime	0·7	0·4–1·2	**4·1**	**2·0–8·4**	**2·1**	**1·2–3·6**	**<0·0001**
	12-month	0·8	0·4–1·4	**3·0**	**1·7–5·4**	1·4	0·9–2·4	**0·001**
Suicidal thoughts and behaviours								
Suicidal ideation	Lifetime	**2·4**	**1·3–4·4**	**3·4**	**2–5·9**	**3·5**	**2·1–5·9**	**<0·0001**
	12-month	1·2	0·4–3·6	**3·9**	**1·9–8·3**	**2·8**	**1·3–6·0**	**<0·0001**
Suicidal attempt	Lifetime	**6·1**	**1·1–32·2**	2·1	0·4–10·5	**5·1**	**1·2–20·7**	**0.035**

The statistically significant results have been highlighted in bold.
[a] **Category of reference:** heterosexuals.
[b] **Adjusted by:** age, gender, country of origin, university, academic field, parents' university studies, living at first term.
[c] **Mood** includes major depression or bipolar disorder; **Anxiety** includes panic disorder or generalised anxiety disorder; **Alcohol or substance** includes abuse or dependence.

Table 3
Risk of lifetime suicidal ideation among minority Spanish university students (multivariate models results). The UNIVERSAL (University and Mental Health) study (n = 1216).

	Model I			Model II			Model III		
	OR[c]	95 % CI	*p-value*	OR[c]	95 % CI	*p-value*	OR[c]	95 % CI	*p-value*
Sexual minority[a]	**3·3**	**2·3–4·6**	**<0·0001**	**2·4**	**1·6–3·5**	**<0·0001**	**2·4**	**1·6–3·5**	**<0·0001**
Any bullying[b]	–	–	–	**2·6**	**1·9–3·5**	**<0·0001**	**2·4**	**1·7–3·3**	**<0·0001**
Any childhood maltreatment[b]	–	–	–	**4·6**	**3·3–6·2**	**<0·0001**	**4·0**	**2·9–5·5**	**<0·0001**
Any mental disorder lifetime[b]	–	–	–	–	–	–	**3·8**	**2·6–5·4**	**<0·0001**
AUC			0·62			0·75			0·78

AUC: area under the curve. The statistically significant results have been highlighted in bold.
[a] Category of reference: heterosexuals.
[b] **Category of reference:** no.
[c] **Adjusted by:** age, gender, country of origin, university, academic field, parents' university studies, living at first term.

Table 4
Risk of 12-month suicidal ideation among homosexual and bisexual Spanish university students (multivariate models results). The UNIVERSAL (University and Mental Health) study (n = 113).

	Model I			Model II			Model III		
	OR[b]	95 % CI	*p-value*	OR[b]	95 % CI	*p-value*	OR[b]	95 % CI	*p-value*
Perceived discrimination 12-m[a]	**3·9**	**(1·2–12·9)**	**<0·05**	3·1	(0·9–10·5)	0·067	2·2	(0·6–8·3)	0·224
Lifetime mental disorders or suicidal ideation at baseline[a]	–	–	–	3·4	(0·6–17·7)	0·152	3·4	(0·6–17·7)	0·152
Any mental disorder 12-m[a]	–	–	–	–	–	–	**7·8**	**(1·1–50·4)**	**0·0356**
AUC			0·65			0·60			0·72

AUC: area under the curve. The statistically significant results have been highlighted in bold
[a] **Category of reference:** no.
[b] **Adjusted by:** age, gender.

found, specifically for bisexual and unsure students. Bisexual individuals more likely experience higher pressure to conform to a binary sexual orientation (Feinstein and Dyar, 2017) and prejudice due to specific stereotypes associated with bisexuality (e.g., confusion or promiscuity) (Mohr and Rochlen, 2004; Sarno et al., 2020). Within the LGB community, bisexuals may also confront prejudicial behaviours and attitudes that may reduce their sense of connection to the community (Chan et al., 2020). Internal uncertainty and sexual orientation concealment could be possible outcomes of the monosexist beliefs and the coercion exerted against bisexuals (Chan et al., 2020).

Both feelings of internal uncertainty and sexual orientation concealment have been associated with poor mental well-being (Pachankis et al., 2020). The decrease or absence of an important resilience source as it is the sense of community belonging that palliates the minority stress experienced by LGBs could worsen the poor mental well-being (Chan et al., 2020). All the mentioned factors may contribute over time to increase the mental health disparities between LGB individuals (Chan et al., 2020; Cronin et al., 2021). Moreover, there is evidence of gender differences in the mental health of LGBs. Bisexual men confront prejudicial behaviours and attitudes within the LGB community. While bisexual women could have worse mental health due to gender roles and stereotypes established in society (Vigod and Rochon, 2020). These results point out to the need of better understanding the implications of intersectionality of gender and sexual orientation for the mental health of LGBs. However, due to small sample size gender differences were not analyzed in this study.

4.2. Childhood and adolescence adversities and mental disorders are involved in SI among LGB university students

Our data shows considerably higher proportions of childhood maltreatment (>30 %) among LGB students compared to previous evidence (ranged from 7.9 % to 12.7 % specifically in youths and 1.2 to a 12.8 odds in adults) (Sterzing et al., 2016; Xu et al., 2020). Previous studies have found that the impact of childhood maltreatment on mental health is significantly greater among sexual minority youths than among heterosexuals (Charak et al., 2019; Clark et al., 2021). Childhood maltreatment impact includes complex combinations of symptoms (e.g., dysregulation, impulsivity, disturbances of attribution and schema, etc.), biopsychosocial impairments (D'Andrea et al., 2012) and suicidality (Angelakis et al., 2019; Sterzing et al., 2016). Even though, our results do not allow us to state any conclusion about the pathways leading to mental disorders nor to SI or about the causal relations between childhood maltreatment, bullying, mental disorders and SI.

Our results show that sexual orientation discrimination increased the risk of SI, which is consistent with minority stress theory (Meyer, 2003). However, when lifetime mental disorders or SI and 12-month mental disorder were taken into account the effect of sexual orientation discrimination was no longer significant suggesting that mental disorders may mediate the relationship between discrimination and SI. Sexual orientation discrimination may contribute to additional stress for LGBs beyond common life stressors (Meyer, 2003). Discriminatory experiences due to sexual orientation are significantly associated with mental disorders (Burton et al., 2013), psychological distress (Bränström and Pachankis, 2018), depressive and anxiety symptoms (Burton et al., 2013; Duba et al., 2020) and suicidality among LGBs. Moreover, the magnitude of the effect on suicidality was likely smaller than that found for depressive symptoms (Burton et al., 2013). Differences in the magnitude of the effect between suicidality and mental disorders would also support the hypothesis of a mediating role of mental disorders. Furthermore, previous studies have suggested that psychological distress and internalised homophobia mediates in the association between discrimination and symptoms of depression (Feinstein et al., 2012; Sterzing et al., 2016). Internalised homophobia may be an important factor in the association between discrimination and STB. However, we could not include assess the role of internalised homophobia in our analyses, due to insufficient data.

4.3. Strengths and limitations

To the best of our knowledge, this is the first study assessing the role of childhood and adolescence adversities on the risk of mental disorders and SI in LGB Spanish university students. We assessed the role of mental disorders in the relationship between perceived sexual orientation discrimination and SI among LGB university students.

The following limitations should be considered. First, the sample of interest was relatively small, due in part to a low response rate at baseline survey and, at a lower extent, due to some loss at 12-month follow-up. This may lead to low statistical power, and may have provided unstable estimates in multivariable models due to small cell count. However, the proportion of the LGB subsample was similar to the observed in comparable studies (Mortier et al., 2018; O'Neill et al., 2018), and low response rates have been noted by other large-scale university student surveys and online surveys (Eisenberg et al., 2013; Wu et al., 2022). Moreover, we applied population-based adjustments and inverse-probability weights, an effective method for reducing non-response bias (Brick, 2013). While low response may affect representativeness, it should not bias the associations analyzed. Second, the assessment of mental disorders and STB was based on self-reports and not on direct clinical assessment. Therefore, they should be better considered as "probable cases". Nonetheless, a good diagnostic agreement has been reported with clinical judgement (Ballester et al., 2019). Third, the discrimination scale was asked only to those who declared as homosexual or bisexual. Therefore, for the assessment of the association between discrimination and SI the sample size was limited. Given the small sample size and the extremely low number of individuals in some combinations, the number of variables taken into account for the model was also limited. Nonetheless, rigorous statistical methods were used (Firth's penalized likelihood) (Firth, 1993) to deal with this issue and ensure the validity of results. Fourth, differences in the risk of mental disorders and STB among LGBs by gender have been observed (Kerr et al., 2013, 2014; Schauer et al., 2013). However, this could not be assessed due to the lack of enough observations. Studies including larger samples and complex models are needed. Finally, a sample of Spanish university students has been included. The applicability of these results is limited to LGB youths in similar cultural settings. For all the above, results must be interpreted with caution.

4.4. Conclusions

This is the first study showing that LGB emerging adults are or have been more frequently exposed to any form of maltreatment or discrimination, which generates a hostile environment, and is associated with higher risk for mental disorders. The specific mechanisms through which childhood and adolescence adversities and sexual orientation discrimination lead to increased risk of mental disorders and STB could not be examined. Further research is needed to clarify the role of mental disorders and whether internalised homophobia or psychological distress mediate the association between perceived sexual orientation discrimination and STB. It will be important to replicate these results in larger, international samples of LGB youths.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2024.02.084.

Funding

Instituto de Salud Carlos III (ISCIII)-FEDER (PI13/00343); Ministerio de Sanidad, Servicios Sociales e Igualdad, PNSD (Exp. 2015I015); ISCIII (Río Hortega, CM14/00125) (Sara Borrell, CD12/00440); ISCIII-FSE+ (Miguel Servet, CP21/00078); Ministerio de Educación, Cultura y Deporte (FPU15/05728); Generalitat de Catalunya (2021 SGR 00624). The funding sources had no role in any of the phases of the conception, design and development of this study neither in the publication process.

CRediT authorship contribution statement

Andrea Miranda-Mendizabal: Writing – review & editing, Writing – original draft, Investigation, Conceptualization. **Pere Castellví:** Writing – review & editing, Supervision, Methodology. **Gemma Vilagut:** Writing – review & editing, Formal analysis. **Itxaso Alayo:** Writing – review & editing, Formal analysis. **José Almenara:** Writing – review & editing, Investigation. **Laura Ballester:** Writing – review & editing, Project administration. **Enrique Echeburúa:** Writing – review & editing. **Andrea Gabilondo:** Writing – review & editing, Investigation. **Margalida Gili:** Writing – review & editing, Investigation. **Philippe Mortier:** Writing – review & editing. **José Antonio Piqueras:** Writing – review & editing, Investigation. **Miquel Roca:** Writing – review & editing, Investigation. **Randy P. Auerbach:** Writing – review & editing, Investigation. **Ronny Bruffaerts:** Writing – review & editing, Investigation. **Ronald C. Kessler:** Writing – review & editing, Validation, Investigation. **Jordi Alonso Caballero:** Writing – review & editing, Supervision, Methodology, Investigation, Funding acquisition.

Declaration of competing interest

Dr. Kessler has received support for his epidemiological studies from Sanofi Aventis; has served as a consultant for Johnson and Johnson Wellness and Prevention, Shire, Takeda; and has served on an advisory board for the Johnson and Johnson Services, Inc. Lake Nona Life Project.

He is a co-owner of DataStat, Inc., a market research firm that carries out healthcare research.

The rest of the authors declare none conflicts of interest.

Acknowledgements

None.

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