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General and LGBTQ-specific factors associated with mental health and suicide risk among LGBTQ students

Georgina H. Gnan[a], Qazi Rahman[a], Greg Ussher[b], Dan Baker[c], Elizabeth West[c] and Katharine A. Rimes[a]

[a]Department of Psychology, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK; [b]Metro Charity, London, UK; [c]Department of Family Care and Mental Health, University of Greenwich, London, UK

ABSTRACT

This study investigated general and LGBTQ-specific factors associated with having a current mental health problem, use of mental health services, suicide risk and self-harm in 1948 LGBTQ university students (ages 16-25) who took part in the Youth Chances community study in the UK. In multivariate logistic regression, factors associated with all four outcomes were female gender, sexual abuse, other abuse or violence, and being transgender. Further factors that were significantly associated with one or more of the outcomes included: being bisexual; thinking they were LGBTQ under the age of 10; coming out as LGBTQ under the age of 16; not feeling accepted where they live; having no out staff at university and experiencing LGBTQ-related crime. In addition to general risk factors, negative experiences relating to being LGBTQ may be associated with the increased risk for mental health problems, suicide risk and self-harm in LGBTQ students.

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Sexuality; higher education; gender; suicide; young adulthood

Introduction

Systematic reviews have reported depression and anxiety disorders to be up to 3 times more common in lesbian, gay, and bisexual (LGB) youth than heterosexual youth, with the highest rates amongst bisexual individuals (Lucassen et al. 2017; Plöderl and Tremblay 2015). Sexual minority youth are also at higher risk for self-harming behaviours compared to their heterosexual counterparts (Muehlenkamp et al. 2015). Recent meta-analyses (Marshal et al. 2011; Miranda-Mendizábal et al. 2017) reported that sexual minority youth were two to three times as likely to be at suicide risk.

There is evidence that young lesbian, gay, bisexual, transgender and questioning (LGBTQ) people may be at even greater risk for symptoms of poor mental health than older LGBTQ adults (Clements-Nolle, Marx, and Katz 2006; Semlyen et al. 2016). Furthermore, student mental health is becoming an increasing concern, with marked increases in both the number of students with serious psychological problems on campus and the number of students seeking psychological support (Hunt and Eisenberg 2010). A recent study looking at lifetime prevalence of suicidal ideation among first-year college students in eight countries found that 33% showed suicidal ideation (Mortier et al. 2018).

CONTACT Katharine A. Rimes katharine.rimes@kcl.ac.uk
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The university environment offers a unique opportunity for preventive and treatment services to be provided for young LGBTQ people. For example, well-being courses may be perceived as less stigmatising than accessing mental health services in the general community. The large numbers of students in most universities also enable LGBTQ well-being groups to be provided for people of a similar age, which may provide helpful social support. Understanding more about risk factors for mental health problems, self-harm and suicide risk in LGBTQ students would help inform such interventions.

In line with their greater rates of mental illness, some evidence suggests that LGBTQ individuals are more likely than heterosexuals to report a perceived need for support from mental health services (Burgess et al. 2008) and more likely to consult mental health professionals (Platt, Wolf, and Scheitle 2017). Despite accessing mental health care more often than heterosexual youth, sexual minority youth are more likely to report low levels of satisfaction and having mental health needs that have not been met (Burgess et al. 2008). Difficulty accessing inclusive, culturally sensitive and effective mental health services may be a contributing factor in the elevated levels of depression, suicide risk, and other mental health concerns among LGBT+ students (Steele et al. 2017).

Most of the research investigating risk factors for mental illness, self-harm and suicide risk in LGBTQ individuals has involved adult samples. Further work is needed to understand the risk factors in young LGBTQ people, especially college/university students, and whether these are similar to those known to be associated in this manner among older LGBTQ adults. Plausible factors documented in prior work include both general risk factors (those that predispose individuals irrespective of gender identity and sexuality) and LGBTQ-specific factors. These will be briefly summarised below.

General risk factors

Previous research indicates that LGBTQ individuals share some of the same general risk factors for mental health problems and suicide risk as their heterosexual counterparts. These include abuse, hopelessness, low self-compassion, low self-esteem, impulsivity, negative social relationships and low social support (e.g. Clements-Nolle et al. 2018; Liao et al. 2015; Rosario, Schrimshaw, and Hunter 2005).

LGBTQ-specific factors

Minority stress theory (Meyer 2003) has provided a framework for understanding sexual minority mental health disparities. It posits that sexual minorities experience distinct, chronic social stressors related to their stigmatised identities, including victimisation, prejudice, and discrimination. These distinct experiences, in addition to everyday or general stressors, disproportionately compromise the mental health and wellbeing of LGBTQ people (Birkett, Newcomb, and Mustanski 2015).

Present study

The present study investigates a wide range of LGBTQ-specific and general factors hypothesised to be associated with mental health problems and suicide risk in LGBTQ youth, including university-specific factors that have not been previously investigated. University

and college students are the focus of this project because LGBTQ young adults are at increased risk of mental health problems, there may be specific university-related risk or protective factors, and the educational context may provide a useful opportunity to provide LGBTQ-specific interventions.

Drawing on minority stress theory and the existing literature the following were hypothesised to be LGBTQ risk factors associated with mental health problems, self-harm and suicide risk: bisexual orientation, transgender identity, negative reactions to coming out from the first friend, identifying as LGBTQ at a younger age, coming out at a younger age, not feeling accepted where they live and most friends being LGBTQ. Further university specific LGBTQ hypothesised risk factors were university staff not being out, staff and students not speaking up against homophobia, and lectures referring negatively to LGBTQ issues. General factors hypothesised to be associated with mental health, self-harm and suicide risk were abuse or violence form someone close, sexual abuse, lower social support and being female. Exploratory analyses were undertaken to investigate which of the factors showed independent relationships with mental health and suicide risk when entered together in multivariate regression models.

Method

Participants and procedure

This study involved the analysis of secondary data from the Youth Chances project, which was funded by the UK Big Lottery Fund. The project investigated the lives and needs of LGBTQ young adults (aged 16–25 years) in the UK. Participants were recruited through LGBTQ and youth organisations, social media, and advertisements in the LGBTQ press, at Gay Pride events and through snowball sampling. Data was collected online between May 2012 and April 2013. Prior to participation, respondents gave informed consent. At the end of the survey, and after sensitive questions, participants were signposted to resources offering further support. The project was approved by the University of Greenwich Research and Ethics Committee and analysis of secondary data reported in the current study received approval from King's College London (ref. PNM/14/ 15–50).

Participants were 1948 sexual or gender minority University or Higher Education students (including 316 postgraduate students), with a mean age of 20.3 years (SD 1.9).

Measures

Sociodemographic characteristics

Participants were included if they were a student at University or a Higher Education institution at the time they completed the questionnaire. They were also identified for inclusion on questions assessing sexuality and gender identity. 'Do you consider yourself to be: (1) heterosexual or straight, (2) gay or lesbian, (3) bisexual, (4) not sure – questioning, (5) something else'. If participants selected 'something else' they were asked 'How do you consider yourself to be?' and provided with a free text box. For gender identity 2 questions were used. 'What gender were you assigned at birth?' with choices 'male', 'female', 'intersex', 'prefer not to say', and 'which of the following describes how you think of yourself now?' with options 'male', 'female', 'in another way'. Participants whose sex assigned at

birth was different to their current gender identity were classified as transgender and included in the present analysis. This included students who identified as male, female or 'in another way' e.g. non-binary. Participants were excluded if they identified as heterosexual unless they were transgender ($n = 106$).

Mental health, self harm and suicide risk

To assess participants' mental health, they were asked the questions 'Do you have any physical or mental health conditions or illnesses lasting or expected to last 12 months or more' and 'Do you have any health conditions or illnesses which affect you and interfere with your normal activities', with 'mental health condition' as one of the response options.

To assess participants' use of mental health services they were asked 'Have you used any of the following health services since the time you knew you were LGBTQ?' They were able to select 'yes, I have used this service' for 'helpline', 'counselling', 'mental health out-patient at hospital', and 'mental health in-patient at hospital'.

Participants' experiences of self-harm were assessed with the question 'Have you ever hurt yourself on purpose? This is sometimes called 'self-harm'.' They could select 'yes, I still do', 'yes, in the past' or 'no'. A dichotomous variable was computed, recoding the responses into 'yes' (ever) and 'no' (never).

Suicide risk was assessed using the Suicide Behaviours Questionnaire-Revised (SBQ-R; Osman et al. 2001), which assesses lifetime experience of suicidal ideation and/or attempts, the frequency of suicidal ideation over the past 12 months, the threat of suicide attempts and future likelihood of suicidal behaviour. The total score ranges from 3 to 18; this was recoded as 0 for no risk and 1 for risk using a cut off of ≥ 7 for substantial risk of suicidal behaviour.

General risk factors

Social support was assessed with the question 'If you had a problem, how many people would you say you could count on for advice and support?' Responses were recoded into 'fewer than five friends' versus 'five or more'.

Lifetime abuse was assessed with the questions 'Have you experienced sexual abuse?' and 'Have you experienced abuse or violence from someone close to you?' Abuse and violence was described as 'This is sometimes called 'domestic violence': any incident of threatening behaviour, violence, or abuse between adults who are or have been intimate partners, friends or family members. This could take a number of different forms: psychological, physical, financial, or emotional. This also includes honour-based violence and forced marriage'.

LGBTQ-related factors

General LGBTQ factors. Age of identifying as LGBTQ, age of coming out, reactions of others to coming out, LGBTQ friends and LGBTQ victimisation were assessed with the following questions:

Participants were asked 'How old were you when you first thought you might be lesbian, gay, bisexual or questioning your sexuality?' and 'How old were you when you first thought you were trans or questioned the gender you were described as at birth?' Responses were recoded to indicate ≥ 10 years versus <10 years and combined for both questions to indicate the age at which they identified as LGBQ or trans.

Responses to the questions 'How old were you when you first told someone you were lesbian, gay, bisexual or questioning your sexuality?' and 'How old were you when you first told someone you were trans or questioning/unsure of your gender?' were combined and recoded into below age 16 or aged 16 and above.

For the question 'How many of your friends are LGBTQ?', responses of 'none', 'about a quarter', 'about half', 'about three quarters' and 'nearly all' were recoded into a dichotomous variable indicating 'none or less than a quarter' versus 'half or more'.

The items 'On a scale of 1–10, what was the reaction of these people in your life when you told them you were lesbian, gay, bisexual or questioning your sexuality?' and 'On a scale of 1–10 what was the reaction of these people in your life when you told them you were trans?' were used to measure the responses of the first friend that participants 'came out' to. On the scale, 1 was labelled as 'very bad' and 10 indicated 'very good'. Responses from 1–5 were recoded to indicate a bad reaction and responses 6–10 were recoded to indicate a good reaction.

Participants responses to the following statement 'I feel like I am accepted in the area where I live now' were recoded from 'disagree' or 'strongly disagree' to indicate lack of acceptance versus all other responses (neither agree or disagree, agree, strongly agree).

Lifetime LGBTQ-specific victimisation was assessed with the question, 'Have you ever experienced any of the following because you are LGBTQ or people thought you were LGBTQ?' with the sub-items being as follows: being outed, name calling/verbal abuse; threat/intimidation; harassment; blackmail; theft; damage to property and physical assault. Responses of 'once', 'more than once' or 'often' were combined and contrasted to 'never' in a dichotomous variable.

University LGBTQ factors. University experiences relating to outness, people speaking out against LGBTQ stigma and LGBTQ issues being addressed in class were assessed with the following questions: Responses to the question 'At university did you have tutors and university staff speaking up against homophobia, biphobia and transphobia' were recoded into 'yes' versus 'no', 'sometimes' or 'don't know'. The same recoding was applied to a similar question about students speaking up. Responses to the question 'At your university, how were LGBTQ issues, people and their achievements handled on your course' were recoded into 'negatively' if they ticked 'referred to negatively' or 'ignored or not mentioned' versus 'included and respected'. To assess whether participants were out at university they were asked 'How many people at your university knew you were LGBTQ?' with options 'no-one', 'one', '2–5', '6–10', 'more than 10' and 'everyone'. Responses were recoded into not out to everyone versus out to everyone. Responses to the question, 'At university did you have out members of staff' were recoded into 'yes' versus 'no', 'sometimes' or 'don't know'.

Statistical analysis

Independent univariate and multivariate logistic regression analyses were conducted for the four outcome measures: use of mental health services, current mental health problem, suicide risk and self-harm. The use of independent univariate models permitted the test of the independent association of one predictor variable with a dependent variable. Multivariate logistic regression tested which risk factors continued to show independent associations with the outcomes when all factors were adjusted simultaneously.

A principal components analysis (PCA) with an oblique rotation was conducted on the eight LGBTQ victimisation items to reduce the correlated observed variables to a smaller set of important independent composite variables. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .83, which is considered a great value (Hutcheson and Sofroniou 1999) and all KMO values for individual items were above the acceptable limit of .5 (Kaiser 1974). Bartlett's test of sphericity X^2 (28) = 4395.31, $p < .001$ indicated that correlations between items were sufficiently large for PCA. An initial analysis was run to obtain eigenvalues for each component in the data. Two components had eigenvalues over Kaiser's criterion of 1 and in combination explained 58.5% of the variance. 0.5 was used as a cut off to determine if the variable contributed to the component in a meaningful way. The items that clustered on the same components suggest that component 1 represented 'criminal victimisation' (theft, damage to property, blackmail, physical assault) and component 2 represented 'verbal victimisation' (name calling, being outed, threat/intimidation, harassment).

Results

Characteristics of the sample

Of the 1948 participants, 914 (46.9%) were female, 901 (46.3%) were male and 133 (6.8%) identified in another way (e.g. gender fluid or non-binary). Participants ranged from 16–25 years of age and the mean reported age was 20.34 years (SD 1.87). Regarding sexual orientation, 21 (1.1%) reported that they were heterosexual or straight, 1201 (61.7%) gay or lesbian, 446 (22.9%) bisexual, 103 (5.3%) not sure – questioning, and 177 (9.1%) something else. Two hundred and fourteen (10.9%) participants were transgender.

Table 1 shows the proportion of participants with each hypothesised risk factor and outcome.

Univariate analyses

Table 2 summarises results of the univariate logistic regression analyses. For all four outcomes (use of mental health services, current mental health problem, suicide risk and self-harm), significant associations were found for all hypothesised general risk factors, individual and interpersonal LGBTQ-related risk factors and discrimination. The risk factors with the largest odds ratios were sexual abuse, other abuse or violence, and being transgender. Of the university-related risk factors, LGBTQ issues not being included and respected during lessons was significantly associated with having a current mental health problem. Having no out members of staff was significantly associated with suicide risk and current mental health problems. Staff and students not speaking up consistently against LGBTQ stigma and not being out to everyone at university were not associated with any of the outcomes.

Multivariate analyses

Results of multivariate analyses are shown in Table 3. Here, factors that were significant in the univariate analyses were entered simultaneously. Female gender, sexual abuse, other abuse or violence from someone close, and being transgender had the highest odds ratios and were significantly associated with all four outcomes.

Table 1. Proportion of participants (n = 1948) with the hypothesised risk factors & outcomes.

Hypothesised risk factors & outcomes	Number who responded to each question	Number (%) with characteristic or experience
Outcomes		*N* (%)
Previous medical help-seeking for anxiety or depression	1817	764 (42.0)
Mental Health problem that interferes with normal activity	1772	432 (24.4)
Mental Health service use (counselling/helpline etc) (39 inpatient, 197 outpatient, 684 counselling, 185 helpline)	1948	768 (39.4)
Thought about killing self in past year	1948	824 (42.3)
Likelihood of attempting suicide in future	1809	185 (10.2)
Told someone going to attempt suicide	1310	497 (37.9)
Significant risk of suicidal behaviour (SBQ-R > 7)	1803	980 (54.4)
General risk factors		
Female	1948	914 (46.9)
Fewer than 5 friends to count on, if had a problem	1943	817 (42.0)
Abuse or violence from someone close	1946	551 (28.3)
Sex abuse below age of 16	1790	190 (10.6)
Self-harm	1817	899 (49.5)
Not feeling accepted where live	1910	245 (12.8)
LGBTQ specific risk factors		
Bisexual	1948	446 (22.9)
Trans	1948	283 (14.5)
Aged below 10 years when thought LGBTQ	1891	291 (15.4)
First told someone was LGBTQ below age 16 years	1871	768 (41.0)
Half or more friends are LGBTQ	1948	642 (33.0)
University staff not speaking up against LGBTQ stigma	1876	1169 (62.3)
Students not speaking up against LGBTQ stigma	1875	401 (21.4)
LGBTQ issues or people not included/respected	1858	442 (23.8)
Out to everyone at uni	1877	921 (49.1)
No out members of staff	1876	1075 (57.3)
Victimisation		
Verbal	1945	1649 (84.8)
Criminal	1945	545 (28.0)

Social support (having fewer than 5 friends to count on) was significantly associated with suicide risk and self-harm. Being bisexual remained a risk factor for current mental health problem, suicide risk and self-harm. Being below the age of 10 when they first thought they might be LGBTQ was significantly associated with use of mental health services. Coming out below the age of 16 remained a risk factor for use of mental health services, having a current mental health problem and self-harm. Having half or more friends who are LGBTQ was a risk factor for use of mental health services and self-harm. Not feeling accepted where they live was significantly associated with suicide risk. If the first friend they came out to had a bad reaction this was significantly associated with self-harm and suicide risk. Having no out members of staff at university remained significantly associated with suicide risk and experiencing criminal victimisation remained significantly associated with self-harm.

Discussion

The high rates of suicide risk, self-harm and mental health problems in this LGBTQ university sample are consistent with previous studies demonstrating an increased risk for these outcomes in LGBTQ students (Semlyen et al. 2016). This study identified a wide range of both general and LGBTQ-specific risk factors associated with these outcomes, some of which were specifically related to university experiences.

Table 2. Results of univariate logistic regression analyses.

General Factors	*N*	Current Mental Health Problem OR (95%CI)	*N*	Suicide Risk OR (95%CI)	*N*	Use of Mental Health services OR (95%CI)	*N*	Self-harm OR (95%CI)
Female gender	1772	2.33(1.87–2.92)***	1803	1.38(1.15–1.67)**	1948	1.83(1.52–2.19)***	1817	3.19(2.63–3.86)***
Fewer than 5 friends to count on	1768	1.51(1.25–1.88)***	1798	1.99(1.65–2.42)***	1943	1.20(1.00–1.45)*	1812	1.72(1.42–2.08)***
Sexual abuse	1767	3.91(3.01–5.08)***	1779	3.92(2.90–5.29)***	1790	3.82(2.93–4.99)***	1789	4.18(3.14–5.57)***
Other abuse or violence	1771	3.08(2.45–3.87)***	1802	3.76(2.98–4.74)***	1946	2.85(2.32–3.49)***	1816	3.93(3.14–4.91)***
LGBTQ-related Factors								
Bisexual vs. monosexual	1772	1.86(1.46–2.38)***	1803	1.47(1.17–1.84)**	1948	1.26(1.02–1.56)*	1817	1.79(1.43–2.24)***
Trans (any sexual orientation) vs cisgender LGBQ	1772	2.64(1.95–3.57)***	1803	3.22(2.30–4.53)***	1948	3.26(2.42–4.38)***	1817	2.48(1.82–3.38)***
Thought LGBTQ <10 years	1720	1.98(1.50–2.61)***	1752	2.08(1.58–2.75)***	1891	2.20(1.71–2.83)***	1764	1.67(1.29–2.17)***
Came out LGBTQ <16 years	1709	1.79(1.43–2.23)***	1736	1.67(1.38–2.03)***	1871	2.03(1.68–2.46)***	1749	2.01(1.65–2.43)***
Half or more friends LGBTQ	1772	1.27(1.01–1.60)*	1803	1.24(1.01–1.51)*	1348	1.71(1.41–2.08)***	1817	1.85(1.52–2.26)***
Not feeling accepted where live	1741	1.48(1.08–2.01)*	1771	2.47(1.81–3.36)***	1910	1.41(1.07–1.84)*	1785	1.81(1.36–2.41)***
Bad reaction – friend	1692	2.33(1.68–3.23)***	1719	2.91(2.03–4.17)***	1852	2.00(1.48–2.70)***	1732	3.33(2.34–4.73)***
Staff not speaking up	1746	0.99(0.80–1.25)n.s.	1777	1.08(0.89–1.31)n.s.	-	-	-	-
Students not speaking up	1746	0.99(0.76–1.29)n.s.	1777	1.11(0.88–1.40)n.s.	-	-	-	-
LGBTQ issues not included	1727	1.31(1.02–1.68)*	1760	1.14(0.91–1.42)n.s.	-	-	-	-
Not out to everyone at uni	1750	1.05(0.85–1.31)n.s.	1781	1.14(0.94–1.38)n.s.	-	-	-	-
Having no out staff	1747	1.36(1.09–1.71)*	1778	1.49(1.23–1.80)***	-	-	-	-
LGBTQ Victimisation								
Criminal	1770	1.54(1.22–1.94)***	1801	2.03(1.63–2.51)***	1945	1.66(1.36–2.03)***	1815	2.19(1.77–2.71)***
Verbal	1770	1.70(1.21–2.38)**	1801	1.65(1.28–2.15)***	1945	1.69(1.29–2.21)***	1815	1.93(1.48–2.52)***

*$p < 0.05$.
**$p < 0.005$.
***$p < 0.0005$.

Table 3. Results of multivariate logistic regression analyses.

General Factors	Current Mental Health Problem OR (95%CI) ($n = 1567$)	Suicide Risk OR (95%CI) ($n = 1595$)	Use of Mental Health Services OR (95%CI) ($n = 1623$)	Self-harm OR (95%CI) ($n = 1623$)
Female gender	2.47(1.86–3.27)**	1.32(1.05–1.67)*	2.23(1.77–2.82)***	4.03(3.15–5.14)***
Fewer than 5 friends to count on	1.26(0.97–1.64)n.s.	1.51(1.20–1.89)***	1.11(0.88–1.39)n.s.	1.40(1.10–1.77)*
Sexual abuse	2.27(1.65–3.13)***	2.05(1.44–2.92)***	1.96(1.43–2.70)***	1.83(1.29–2.59)**
Other abuse or violence	1.81(1.36–2.39)***	2.40(1.85–3.15)***	2.09(1.62–2.70)***	2.62 (1.99–3.44)***
LGBTQ-related Factors				
Bisexual vs. monosexual	1.59(1.19–2.14)**	1.51(1.14–1.99)**	1.16(0.89–1.53)n.s.	1.39(1.05–1.84)*
Trans (any sexual orientation) vs cisgender LGBQ	2.77(1.89–4.09)***	2.44(1.64–3.63)***	3.25(2.25–4.68)***	2.95(2.01–4.31)***
Thought LGBTQ <10 years	1.27(0.90–1.78)n.s.	1.39(0.99–1.94)n.s.	1.41(1.03–1.94)*	0.98(0.70–1.37)n.s.
Came out LGBTQ <16 years	1.34(1.03–1.75)*	1.25(0.99–1.57)n.s.	1.47(1.17–1.84)**	1.42(1.12–1.80)**
Half or more friends LGBTQ	0.93(0.71–1.22)n.s.	0.95(0.75–1.21)n.s.	1.33(1.06–1.68)*	1.43(1.12–1.82)**
Not feeling accepted where live	1.02(0.70–1.50)n.s.	1.96(1.35–2.83)***	1.10(0.78–1.54)n.s.	1.16(0.81–1.67)n.s.
Bad reaction – friend	1.34(0.91–1.98)n.s.	1.58(1.05–2.38)*	1.10(0.76–1.59)n.s.	1.69(1.12–2.55)*
LGBTQ issues not included	1.13(0.84–1.51)n.s.	-	-	-
Having no out staff	1.16(0.90–1.51)n.s.	1.33(1.07–1.65)*	-	-
LGBTQ Victimisation				
Criminal	1.12(0.83–1.49)n.s.	1.24(0.95–1.61)n.s.	1.24(0.96–1.60)n.s.	1.67(1.27–2.18)***
Verbal	1.24(0.82–1.88)n.s.	1.25(0.91–1.72)n.s.	1.18(0.85–1.65)n.s.	1.33(0.94–1.86)n.s.

*$p < 0.05$.
**$p < 0.005$.
***$p < 0.0005$.

General factors

As predicted, several general risk factors for suicide risk, self-harm and mental health problems that have been previously identified in the wider population were also found in this LGBTQ sample. Being female was independently associated with use of mental health services, having a current mental health problem, suicide risk and self-harm in multivariate analyses, consistent with previous research identifying this as a risk factor in LGBTQ youth (Marshal et al. 2013). The odds ratios ranged from about 1.3 – 4, indicating a very substantial increased risk associated with being female.

The elevated risk for female participants could partly be explained by sexism in society and possible differences in the way men and women experience sexual minority-related stress (Lewis, Kholodkov, and Derlega 2012). Sexual minority women experience minority stress both as a woman and as a sexual minority, and their combined effect has been found to have a greater impact on the mental health of same-sex attracted women than either factor alone (Szymanski 2005). Previous research indicated the increased risk for depression among women in general appears to be amplified in the context of sexual minority status (Lewis, Kholodkov, and Derlega 2012), with sexual minority girls being at an increased risk for early onset depression and comorbid suicide risk (Marshal et al. 2013).

Sexual abuse was also associated with increased risk for all four outcomes in multivariate analyses, with odds ratios around 2, indicating that this is a very important risk

factor. Although this is a well-established risk factor in the general population (Devries et al. 2014), there is limited research investigating sexual abuse as a risk factor for suicide risk and mental health issues in LGBTQ youth. One study found that LGB students with greater exposure to adverse childhood experiences, including sexual abuse, were at a greater risk for suicide ideation and attempts (Clements-Nolle et al. 2018). Sexual and gender minority youth have elevated rates of childhood sexual abuse (Friedman et al. 2011). Furthermore, a US longitudinal study found that sexual harassment victimisation from peers predicted increases in depressive symptoms among LGBTQ adolescents (Hatchel, Espelage, and Huang 2017).

Consistent with previous research (Balsam et al. 2010; Buller et al. 2014; Clements-Nolle et al. 2018; Espelage, Merrin, and Hatchel 2018; Friedman et al. 2011), experiencing abuse or violence from someone close was also associated with increased risk for all four outcomes in multivariate analyses, with odds ratios from 1.8 to 2.6, indicating that this risk factor requires attention. One study on LGB youth found that the frequency with which they experienced abuse was significantly related to younger age of self-labelling or disclosing a minority sexual orientation and those whose sexual orientation is less concealed or concealable are particularly vulnerable for abuse (Pilkington and D'Augelli 1995).

Lower social support was associated with suicide risk and self-harm in multivariate analyses and with all four outcomes in univariate analyses. This is in line with a UK study which found lower social support was associated with engaging in self-harm among trans participants (Davey et al. 2016) and US research which found that losing friends when youth came out as LGB was significantly associated with suicide attempts (Puckett et al. 2017). This suggests that social support may be a protective factor for LGBTQ students. This could be due to it's positive effect on self-esteem (Dumont and Provost 1999; Snapp et al. 2015; Watson, Grossman, and Russell 2016). Unfortunately, LGBTQ youth may have fewer friends, as a recent study found that LGB students reported significantly lower popularity among peers than heterosexual students (Tucker et al. 2016).

LGBTQ-related factors

In addition to general risk factors, this study identified a number of risk factors specific to LGBTQ students that collectively may help explain the higher rates of self-harm, suicide risk and mental health problems in this population. In line with minority stress theory, the current study found that many LGBTQ-specific experiences were associated with suicide risk, self-harm and mental health problems, including several LGBTQ-specific factors that have not been investigated in previous studies with LGBTQ students.

Of the LGBTQ-related factors, the highest odds ratios for all four outcomes were associated with being trans or non-binary, rather than being LGBQ with a gender identity consistent with one's sex assigned at birth. This elevated risk is consistent with previous research (Marshall et al. 2016). Also as predicted, relative to participants with only same-sex attractions, bisexual students reported higher mental health problems, suicide risk and self-harm, in line with previous findings (Pompili et al. 2014; Salway et al. 2018). This may be due to the erasure and invisibility of bisexual people in society and various forms of biphobia they encounter, for example negative attitudes that question the authenticity of bisexual identities, as well as the lack of bisexual-affirmative support (Salway et al. 2018).

Being under the age of 10 when they first thought they were LGBTQ was associated with all four outcomes in univariate analyses and remained significantly associated with having used mental health services in multivariate analyses. US research found that younger age of first same-sex attraction was associated with more attempted suicides and poorer mental health (Hershberger, Pilkington, and D'Augelli 1997; Mustanski and Liu 2013). Further research is needed but it is possible that experiencing same sex attraction at a younger age is a risk factor due to being exposed to LGBTQ stigma or victimisation from an earlier age, regardless of whether they were out or not, with potential negative impact on identity development. Furthermore, people who identify as LGBTQ at a younger age will have had less opportunity to develop effective coping resources to cope with stigma processes (Seiffge-Krenke, Aunola, and Nurmi 2009). There may be a need for interventions to target LGBTQ people before puberty to prevent these early experiences from being harmful and prevent the development of mental health problems and suicidal behaviours.

Coming out below the age of 16 years was also associated with all four outcomes in univariate analyses and remained significantly associated with use of mental health services, current mental health problem and self-harm in multivariate analyses. This is in line with studies of LGB youth in the US which suggest that younger age of disclosing a minority sexual orientation is a risk factor for experiencing poorer mental health and suicide attempts (D'Augelli et al. 2005; Hershberger, Pilkington, and D'Augelli 1997). This could be due to experiencing greater cumulative victimisation (Mustanski and Liu 2013). While coming out can have interpersonal and psychological benefits, such as contact with similar others, group based protection and a unified sense of self (Crocker and Major 1989; Pachankis, Cochran, and Mays 2015; Rosario et al. 2006), when the experience is associated with rejection and discrimination this brings psychological challenges (Ryan, Legate, and Weinstein 2015). These findings indicate that earlier interventions, when young people are at school, are likely to be required. This might include strictly enforced anti-bullying policies and sources of support for LGBTQ students.

The current study extends our understanding of initial and specific disclosure experiences by showing that bad reactions to coming out from the first friend was associated with a doubling of risk for all four outcomes in univariate analyses and remained significantly associated with increased rates of self-harm and suicide risk in multivariate analyses. This is in line with another cross-sectional study that found that receiving negative reactions from one's best friend was associated with greater depression and lower self-esteem (Ryan, Legate, and Weinstein 2015). Reactions of peers are likely to be particularly significant to LGBTQ youth as they tend to come out to friends before they come out to anyone else (D'Augelli, Pilkington, and Hershberger 2002). A negative reaction from the first friend one comes out to may play a role in influencing the age at which LGBTQ youth come out to others as it may foster low self-esteem.

Reporting that half or more of one's friends are LGBTQ was associated with all four outcomes in univariate analyses and remained associated with greater use of mental health services and self-harm in multivariate analyses. This may be an indicator of having lost heterosexual friends due to one's sexual orientation or gender identity, which was found to be associated with increased suicide risk and depression in a previous cross-sectional study (Hershberger, Pilkington, and D'Augelli 1997). Rejection from peers may be particularly damaging for students given that young adults may be at earlier stages of their identity

development when they are more likely to be relying on friends and family for support (Puckett et al. 2017). However it could be due to other factors such as greater exposure to suicide risk and self-harm and help seeking in one's LGBTQ friends.

Not feeling accepted where one lives was significantly associated with all four outcomes in univariate analyses and with suicide risk in multivariate analyses. This has not previously been investigated as a risk factor for suicide in LGBTQ young people. It would be interesting to examine this in further detail to see if this reflects factors such as rejection experiences or ongoing hostility about one's sexual orientation or gender identity. It may also be related to anticipated prejudice (worrying about being rejected), as this has been found to be associated with mental health problems in previous studies (Sattler and Christiansen 2017).

LGBTQ-related crime and verbal victimisation experiences were associated with all four outcomes in univariate analyses. LGBTQ-related crime remained significantly associated with self-harm in multivariate analyses and this is the first time it has been investigated as a risk factor in LGBTQ students. The verbal victimisation findings are in line with a longitudinal study that showed that high school students who experience more homophobic name-calling victimisation show significant increases in their psychological distress (Tucker et al. 2016). These findings highlight the importance of targeting LGBTQ-related crime and verbal harassment at universities and elsewhere.

University-related LGBTQ risk factors

Contrary to expectations, staff and students not speaking up consistently against LGBTQ stigma was not significantly associated with any of the outcomes. This contrasts to findings by Rimes et al. (2018) that teachers and students not speaking up against stigma at schools (up to the age of 18 years) was associated with suicidal ideation in young adults. Other findings have suggested school climates that protect sexual minority students may reduce their risk of suicidal thoughts (Hatzenbuehler et al. 2014). The rates of school students (up to the age of 18) not speaking out consistently were much higher in the Rimes et al. (2018) study (89%) than in the present university study (21%) indicating that most LGBTQ students can rely on their peers for support. However 62% of the university sample in the present study reported that university staff did not consistently speak out about LGBTQ stigma which indicates more improvement is needed in this area.

Only about half of the students were out to everyone at university, but not being out to everyone was also not associated with any of the outcomes. As discussed above, disclosure of a sexual or gender minority status has been associated with both positive and negative effects on wellbeing (Bry et al. 2017) and these require further investigation.

LGBTQ issues being ignored or discussed disrespectfully on university courses were reported by 24% of the students and this was associated with current mental health problems in univariate analyses but not in multivariate analyses. Having no out staff was reported by 57% of students; this was associated with suicide risk in multivariate analyses and having a current mental health problem in the univariate analyses. These findings indicate that universities could play an important role in helping to prevent suicide risk and mental health problems in LGBTQ students, by providing supportive environment members not referring negatively to LGBTQ issues or people and having visibly out staff.

Limitations

Findings from this study should be interpreted in light of several limitations. Due to the cross-sectional design, no direction of causality can be determined. However, anonymous cross-sectional survey methods are often the best way to access under-represented sexual and gender minority populations, especially in social contexts where certain sexualities or gender identities are highly stigmatised or where LGBTQ youth feel that concealment is important. Critically, they can guide future prospective empirical work by identifying the kinds of factors that might be important to focus on. Future research should use clinical assessment or validated measures for different mental health conditions rather than single questions.

Another limitation of the study is the targeted recruitment used to recruit a large number of LGBTQ youth. It cannot be assumed that the results are generalisable to all LGBTQ students. The sample was generally urban rather than rural, and may be somewhat more comfortable with their sexuality or have greater engagement with the LGBTQ community in such a manner that exposes them more to advertisements for sexuality-related research studies. This problem of ascertainment bias is not unique to sexual minorities but applies to research with many minority and/or difficult-to-access groups. Further, the data was collected between 2012 and 2013. If the study were repeated, findings may differ as the number of individuals identifying as LGBTQ is increasing and people are coming out at younger ages (Russell and Fish 2016; Zucker et al. 2016).

Conclusions

This study demonstrates that in addition to known general risk factors for mental health problems and suicide risk, various LGBTQ-specific factors are associated with these outcomes in LGBTQ university students. Preventive interventions should take into account that LGBTQ students have specific experiences that may contribute to their elevated risk of mental health problems, self-harm and suicide risk. Particular attention should be paid to the most vulnerable LGBTQ student subgroups, including female, bisexual and transgender individuals. The educational context provides a valuable but underused opportunity for prevention and treatment of mental health problems and self-harming behaviours in young LGBTQ people.

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