Minority stress factors as mediators of sexual orientation disparities in mental health treatment: a longitudinal population-based study

Richard Bränström

ABSTRACT

Background Substantial mental health disparities between lesbian, gay and bisexual (LGB) individuals compared with heterosexuals have been identified. The aim was to examine potential sexual orientation-based disparities in mental health treatment in a prospectively analysed population-based sample in Sweden and to explore potential moderators and mediators.

Method 30,730 individuals from the Stockholm Public Health Cohort were followed up with questionnaires and registry-based health record data on psychiatric healthcare visits and prescription drug use between 1 January 2011 and 31 December 2011.

Results In adjusted analyses, gay and lesbian individuals were more likely to receive treatment for anxiety disorders (adjusted OR=3.80; 95% CI 2.54 to 5.69) and to use antidepressant medication (OR=2.13; 95% CI 1.62 to 2.79); and bisexuals were more likely to receive treatment for mood disorders (OR=1.58; 95% CI 1.00 to 2.48), anxiety disorders (OR=3.23; 95% CI 2.22 to 4.72) and substance use disorders (OR=1.91; 95% CI 1.12 to 3.25), and to use antidepressant medication (OR=1.91; 95% CI 1.12 to 3.25) when compared with heterosexuals. The largest mental health treatment disparities based on sexual orientation were found among bisexual women, gay men and younger lesbian women. More frequent experiences of victimisation/threat of violence and lack of social support could partially explain these disparities.

Conclusions This study shows a substantially elevated risk of poor mental health among LGB individuals as compared with heterosexuals. Findings support several factors outlined in the minority stress theory in explaining the mechanisms behind these disparities.

INTRODUCTION

An increasing body of research shows large mental health disparities between sexual minorities as compared with heterosexual individuals. In particular, lesbian, gay and bisexual (LGB) youths have a greater risk for suicide attempts than non-LGB youths and higher prevalence of depression and anxiety diagnoses. Earlier studies have found that sexual minorities are between 1.4 and 4 times more likely to have a lifetime history of mental disorder when compared with heterosexuals.

Sexual orientation health disparities have largely been explained through minority stress theory, which describes the excess stress that LGB individuals experience when compared with heterosexual individuals by virtue of their stigmatised sexual orientation. This minority stress, in the form of prejudice, discrimination, sexual orientation concealment, expectations of rejection and internalised stigma, additively combines with general life stress to confer adverse health outcomes. Studies have found higher exposure to stressors among sexual minorities than among heterosexuals regarding victimisation, employment discrimination, harassment at school and family rejection. This increased exposure may partly account for sexual orientation disparities in mental health.

AIMS OF THE STUDY

The primary aim was to examine mental health treatment disparities between sexual minority individuals and heterosexuals in Sweden using a population sample followed longitudinally. A second aim was to examine if potential sexual orientation...
differences in mental health could be explained, or partially explained, by exposure to minority stressors (ie, victimisation, threat of violence) and ameliorating factors (ie, social support). Finally, we wanted to explore gender, age, country of birth, income, relationship status and level of education as possible effect modifiers of potential disparities.

**MATERIAL AND METHODS**

**Study sample**
The Stockholm Public Health Cohort is a prospective study managed by the Stockholm County Council. For this study, we used data for the 30 730 individuals (18 years and older) recruited in the fall of 2010 that successfully returned a baseline paper-and-pencil mailed questionnaire or self-administered web survey (response rate: 61%). In addition to a question regarding sexual orientation, the survey included questions regarding sociodemographic characteristics, health status and other life circumstances. Survey results were linked with data from national health and administrative registries using personal identification numbers. The study was approved by the Regional Ethics Committee in Stockholm, Karolinska Institute (number 2014/325-31/1).

**Self-report measures**

*Sexual orientation*: Individuals reported their sexual orientation by responding to an item phrased: ‘What is your sexual orientation?’ with the response categories: ‘heterosexual’, ‘bisexual’, ‘gay/lesbian’ and ‘not sure’. A total of 28 434 (92.5%) individuals responded that they identified as heterosexual, 361 (1.2%) as gay or lesbian, and 381 (1.2%) as bisexual. We excluded 394 (1.3%) individuals who responded that they were uncertain of their sexual orientation, as well as the 1160 (3.8%) respondents who did not respond to the question. Those who did not respond were more likely to be older, female, single, have low income, be born outside of Sweden, and to have lower education than those who responded (all p<0.001). Those who responded that they were unsure of their sexual orientation were more likely to be single, have low income, be born outside of Sweden, and to have lower education than those who reported being gay/lesbian/bisexual or heterosexual (all p<0.001).

*Household composition*: One question was included regarding living situation and whether or not the respondent shared a household with a partner (yes/no).

*Mental health determinants*: Two questions were included regarding experiences of victimisation and threat of assaults during the past 12 months: ‘During the past 12 months, have you ever been physically assaulted [yes/no]?’ and ‘During the past 12 months, have you ever been exposed to threats or threats of violence, severe enough to make you scared [yes/no]?’. One question was used to assess social/emotional support: ‘Do you have one or several individuals in your life, who can give you personal support in managing personal problems or crises in your life [yes, always]; [yes, most of the time]; [no, usually not]; and [no, never]?’. The analyses of mediation and moderation by victimisation/threats and social support on mental health treatment were conducted in three steps. First, the mediating effects of victimisation/threats on the link between sexual orientation and mental health treatment were tested along with the potential moderating or buffering effect of social support on this mediation (through moderated mediation analysis). Second, the indirect effects of victimisation and social support as mediators of the link between sexual orientation and mental health treatment were tested (through multiple mediation analysis). Third, the moderating effects of all measured sociodemographic variables were tested. These analyses examined the potential moderating effect by sociodemographics on both the link between victimisation and mental health treatment, as well as the link between social support and mental health treatment. Analyses were performed using SPSS V.22 and mediation/moderation analyses were performed with the Hayes PROCESS macro for SPSS producing regression estimates with bias-corrected bootstrap CIs for the indirect effects.

**RESULTS**

Table 1 presents sociodemographic characteristics, exposure to victimisation and threats, and social support by sexual orientation? sexual orientation — Self-report measures

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orientation separately for gays/lesbians, bisexuals and heterosexual individuals. Bisexuals were younger and had lower income than both gays/lesbians and heterosexuals, and gays/lesbians were younger than heterosexuals. Heterosexuals were more likely to live with a partner and be born in Sweden. Gays/lesbians and bisexuals were more likely to report experiences of victimisation and threat of assaults than heterosexuals. Heterosexuals reported greater access to social support than the other groups.

### Prevalence of mental health treatment

During the 12 months follow-up period, 5.8% of gay/lesbian individuals, 13.3% of bisexuals and 3.2% of heterosexuals had at least one psychiatric healthcare visit. Among those with any psychiatric healthcare visit, the mean number of visits was 5.05 for gays/lesbians with an SD of 4.52; the mean number of visits for bisexuals was 4.49 (SD=5.83) and 3.53 (SD=4.43) for heterosexuals. The difference in the mean number of visits between groups was not significant ($F=2.49$, $p=0.08$). During the follow-up, 15.5% of gays/lesbians, 17.9% of bisexuals and 9.1% of heterosexuals used antidepressive medication. In adjusted analyses, gay/lesbian individuals were more likely to receive healthcare treatment for mental diagnosis and use antidepressant medication than heterosexuals (table 2). Separate analyses for specific mental health diagnosis groups showed that gays/lesbians had an elevated risk of being treated for anxiety disorders as compared with heterosexuals. Bisexual individuals were more likely to receive treatment for mental diagnoses and to use antidepressive medication as compared with heterosexuals. Separate analyses for specific mental health diagnosis groups showed that bisexuals had an elevated risk of being treated for mood disorders, anxiety disorders and substance-use disorders as compared with heterosexuals.

### Mediators of the effect of sexual orientation on mental health outcomes

A simple mediation analysis of the mediation effect of victimisation or threat of assaults on the link between sexual orientation and mental health treatment showed a significant indirect effect ($\beta=0.03$) and the bias-corrected bootstrap 95% CI was above zero (0.02 to 0.06). This effect was, however, not moderated by social support. As a next step, serial multiple mediation analyses were conducted (figure 1). The analyses showed significant indirect mediating effects of the link between sexual orientation and mental health treatment for both victimisation/threats and social support. In addition, the path from sexual orientation to victimisation/threats to social support showed a small but significant effect on mental health treatment. However, the direct effect of sexual orientation on mental health treatment was still significant after controlling for the indirect effects, suggesting that other unmeasured factors explain a substantial proportion of the sexual orientation-based disparities in mental health.

### Sociodemographic factors as moderators

A number of sociodemographic factors were tested as moderators of the association between sexual orientation and mental health outcomes. Significant moderating effects of the association between sexual orientation and mental health treatment were found for age and gender, but not for country of birth, education, living with a partner and income. In table 2, stratified analyses for age and gender are presented for those outcomes that showed a significant interaction effect. Among gays/lesbians, sexual orientation disparities in healthcare visits for any mental diagnosis were only significant among women and younger individuals. However, large disparities based on sexual orientation were found among gay men for mood disorders and use of antidepressive medication. Disparities in anxiety disorders were only significant among

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Table 1 Sociodemographic characteristic and self-reported victimisation, threat of assaults, and social support by self-reported sexual orientation in the Stockholm Public Health Cohort 2010

<table>
<thead>
<tr>
<th></th>
<th>Gay/lesbian n=325</th>
<th>Bisexual n=392</th>
<th>Heterosexual n=12659</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary school/high school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean yearly income in (Swedish Kronor, in thousands)</td>
<td>309 (606)</td>
<td>200 (190)</td>
<td>302 (356)</td>
</tr>
<tr>
<td>Relationship status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living with partner/spouse</td>
<td>196 (54)</td>
<td>195 (51)</td>
<td>18 673 (66)</td>
</tr>
<tr>
<td>Nation of birth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other European country</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-European country</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threat of assault, past 12 months</td>
<td>13 (4)</td>
<td>21 (6)</td>
<td>629 (2)</td>
</tr>
<tr>
<td>Social support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No, usually not</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, always</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Yes, most of the time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No, usually not</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No, never</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p <0.05$; ** $p <0.01$; *** $p <0.001$. 

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Bränström R. *J Epidemiol Community Health* 2017;71:446–452. doi:10.1136/jech-2016-207943. 

Ethnicity & health

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younger gays/lesbians as compared with heterosexuals. Disparities in use of antidepressive medication was larger among younger than older gays/lesbians as compared with heterosexuals. Among bisexuals, sexual orientation disparities in healthcare visits for any mental diagnosis were larger among women and younger individuals. Disparities in use of antidepressive medication were only significant among younger bisexuals.

To give a more nuanced understanding of the intersecting influence of sexual orientation, gender and age, additional analyses were conducted using categorisation of participants based on all three of these factors (table 3). The largest mental health treatment disparities based on sexual orientation were found among bisexual women, gay men and younger lesbian women. Compared with young heterosexual men, only young gay men and young bisexual women reported more frequent exposure to victimisation or threat of assaults in the past 12 months. Lack of social support was more than five times as common among young lesbian women as compared with young heterosexual men. Young gay men, young bisexual women and bisexual men were between two and three times as likely to report lack of social support as compared with young heterosexual men.

In addition to testing the moderating effect of sociodemographic factors on the direct relation between sexual orientation and mental health treatment, moderated mediation analyses were performed to establish if the indirect mediating effects of victimisation/threats and social support on mental health treatment varied by age, gender, education, income, partnership status and country of birth. There were no significant moderating effects for any of the sociodemographic factors on the mediating effect of victimisation/threats on mental health treatment. Age, gender, level of education and income did not show a significant moderating effect of the mediating effect of social support.

### Table 2

Adjusted exponential β-coefficient and ORs for sexual orientation-related disparities in frequency of healthcare visits for mental disorders and use of antidepressive medication in the Stockholm Public Health Cohort 2011

<table>
<thead>
<tr>
<th></th>
<th>Healthcare visits for any mental disorder</th>
<th>Healthcare visits for any mood disorder</th>
<th>Healthcare visits for any anxiety disorder</th>
<th>Healthcare visits for substance-related disorder</th>
<th>Use of antidepressive medication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adj. Exp. β (95% CI)</td>
<td>Adj. Exp. β (95% CI)</td>
<td>Adj. Exp. β (95% CI)</td>
<td>Adj. Exp. β (95% CI)</td>
<td>AOR (95% CI)</td>
</tr>
<tr>
<td>Heterosexual (reference)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gay/lesbian</td>
<td>2.33*** (1.88 to 2.90)</td>
<td>1.28 (0.72 to 2.30)</td>
<td>3.80*** (2.54 to 5.69)</td>
<td>1.24 (0.69 to 2.22)</td>
<td>2.13*** (1.62 to 2.79)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>1.22 (0.85 to 1.75)</td>
<td>3.01*** (1.56 to 5.81)</td>
<td>1.24 (0.69 to 2.22)</td>
<td>2.96*** (2.10 to 4.16)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>3.65*** (2.76 to 4.82)</td>
<td>0.32 (0.08 to 1.29)</td>
<td>1.24 (0.69 to 2.22)</td>
<td>1.36 (0.87 to 2.13)</td>
</tr>
<tr>
<td></td>
<td>16–34 years</td>
<td>4.65*** (3.49 to 6.18)</td>
<td>8.07*** (5.04 to 12.93)</td>
<td>1.24 (0.69 to 2.22)</td>
<td>3.06*** (1.92 to 4.89)</td>
</tr>
<tr>
<td></td>
<td>35 years or older</td>
<td>0.99 (0.67 to 1.46)</td>
<td>0.76 (0.24 to 2.38)</td>
<td>1.24 (0.69 to 2.22)</td>
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</tr>
<tr>
<td>Bisexual</td>
<td>3.60*** (3.03 to 4.27)</td>
<td>1.58* (1.00 to 2.48)</td>
<td>3.23*** (2.22 to 4.72)</td>
<td>1.91* (1.12 to 3.25)</td>
<td>2.06*** (1.59 to 2.68)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>1.77** (1.16 to 2.69)</td>
<td></td>
<td></td>
<td>1.08 (0.54 to 2.14)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>4.78*** (3.94 to 5.80)</td>
<td></td>
<td></td>
<td>2.34*** (1.75 to 3.13)</td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35 years or older</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All primary models were adjusted for gender, age, education, income, relationship status and country of birth. Analyses were stratified by gender or age if test of interactions were significant at p<0.05. All models take into account sample weights and stratification.

Adj. Exp. β, adjusted exponential β-coefficient; AOR, adjusted ORs. *p <0.05; **p <0.01; ***p <0.001.

Figure 1: Multiple indirect effects of victimisation or threat of violence and social support on the relationship between sexual orientation and mental health treatment.
support on mental health treatment. However, the mediating effect of social support on mental health treatment was larger among individuals born in Sweden ($\beta=0.24$; 95% CI 0.19 to 0.30) and those living with a partner ($\beta=0.26$; 95% CI 0.20 to 0.32), and lower among those born outside of Sweden ($\beta=0.18$; 95% CI 0.13 to 0.24) and those not living with a partner ($\beta=0.22$; 95% CI 0.17 to 0.27).

### Discussion

This study used prospective data from a population-based representative sample of adults with linkage to the comprehensive and high-quality health records available in Sweden to assess sexual orientation differences in mental health treatment. Our analyses suggest a substantially elevated risk of poor mental health among gay, lesbian, and bisexual adults compared with heterosexuals. Sexual orientation disparities were present for treatment of mood disorders, anxiety disorders, and substance-related disorders, as well as for treatment with antidepressant medication. The level of disparity varied substantially between individuals with varying sociodemographic characteristics, highlighting the importance of considering multiple social identities when analysing the health status of sexual minorities. The largest mental health treatment disparities based on sexual orientation were found among bisexual women, gay men and bisexual men, and younger lesbian women. Our results gave additional support for the minority stress theory on multiple social identities when analysing the health status of sexual minorities.

Many studies of sexual orientation health disparities rely on non-random samples which limits the generalisability of the findings. The sample size also enabled us to test the moderating effects of several different sociodemographic factors. Our results add to the growing number of research studies showing evidence of elevated rates of poor mental health among sexual minorities. These results suggest a need for potential reformulation of the minority stress theory. Further, our results showed a small but significant indirect effect from sexual orientation to victimisation/threats to social support on mental health. This could indicate that exposure to minority stress has a negative influence on sexual minority individuals’ capacity to develop and sustain supportive social connections, which then has a detrimental effect on mental health outcomes. Further research is needed to outline the causal pathways through which the constructs described in the minority stress theory are linked and for which type of minority stressors social support has an ameliorating effect.

The stratified findings in our study are consistent with earlier research showing poorer mental health among younger, as compared with older, LGB individuals. The lack of a moderating effect of country of birth does not support an additive negative effect of multiple minority identities on mental health, and is in line with some recent studies in the USA examining the intersecting effect of race and sexual orientation on health.

This study has several strengths, including the large representative population-based data set with information on sexual orientation and prospectively collected information on mental health status. The quality, coverage, and validity of these registries have been found to be high with low degree of misclassification. Many studies of sexual orientation health disparities rely on non-random samples which limits the generalisability of the findings. The sample size also enabled us to test the moderating effects of several different sociodemographic factors.

Several limitations of this study should be considered. Assessment of sexual orientation was made with a single-item question of sexual orientation identity and might not be generalisable across different operationalisations of sexual orientation. We
only had access to hospital-based mental healthcare usage; thus, some individuals who might have been solely treated within the primary healthcare system were not included in our current analyses. However, the inclusion of use of antidepressant medication compensates for this limitation to some degree. The Swedish Prescribed Drug Register covers all prescribed medication use in the population with a very high degree of coverage, and thus all individuals in our cohort with prescribed drug treatment for depression should have been identified.40 Further, our data on minority stress exposure were limited to exposure to past year victimisation/threats and social support, and we had no access to sexual orientation-specific stress exposures, for example, concealment of sexual orientation, internalised stigma and fear of rejection. Thus, future studies need to further investigate the full spectrum of mechanisms behind sexual orientation-based disparities in mental health.

What is already known on this subject

Despite significant changes in legislation and attitudes towards homosexuality during the past decades, studies have shown that gay, lesbian and bisexual individuals report substantially higher rates of adverse mental health outcomes than heterosexuals. Sexual orientation health disparities have largely been explained through minority stress theory which describes the excess stress that sexual minority individuals experience compared with heterosexuals by virtue of their stigmatised sexual orientation. The research describing and supporting these mechanisms is increasing but many studies use cross-sectional self-report measures of health outcomes and its predictors.

What this study adds

- This study shows a substantially elevated risk of mental healthcare usage among gay, lesbian and bisexual individuals as compared with heterosexuals using longitudinal non-self-report data.
- The results demonstrate the importance of considering the intersecting influence of multiple sociodemographic identities when analysing disparities based on sexual orientation. The results show that sexual orientation disparities in mental health treatment were largest among bisexual women, gay men and younger lesbian women.
- Our results give additional support to the factors outlined in the minority stress theory, such as exposure to victimisation or threats and lack of social support, in explaining the mechanisms behind these disparities.
- The elevated prevalence of mental disorders among sexual minority individuals calls for increased research to better understand the underlying mechanisms and for the urgent need to develop targeted interventions to prevent and effectively address poor mental health among sexual minorities.

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Competing interests None declared.

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REFERENCES