Loneliness in sexual minority and heterosexual individuals: a comparative meta-analysis

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Loneliness in sexual minority and heterosexual individuals: a comparative meta-analysis

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ABSTRACT

Introduction: Despite the importance of better understanding how loneliness is associated with physical and mental health symptoms and disorders, and who is at greatest risk, demographic information pertaining to sexuality is often not collected. Although some studies evidence prevalence rates of loneliness amongst sexual minority individuals to be higher when compared to heterosexual individuals, no systematic approaches to examine and compare the literature have been taken. This comparative meta-analysis examined loneliness between sexual minority and heterosexual individuals.

Method: To identify studies, published studies were searched from the following databases MeDLiNE, CINAHL, PsychINFO, Scopus, and Cochrane. Studies that were published in English, compared sexual minorities and heterosexuals; measured loneliness; and presented quantitative data were included.

Result: Four articles were included in the review, reporting data from 481 individuals who identified as sexual minorities and 4176 as heterosexuals. The 4 studies showed that individuals who identified as sexual minorities reported higher ratings of loneliness than heterosexuals ($d=0.352$, $p=0.019$).

Conclusion: Interventions are needed at the individual and societal level to decrease the loneliness experienced by sexual minorities. This is the first paper to provide aggregated data on loneliness that covers the life span amongst sexual minorities.

Loneliness is a significant health problem (Beutel et al., 2017). Rooted in the discrepancy model of loneliness (Peplau & Perlman, 1982), loneliness is defined as an emotional state of dissatisfaction individuals feel due to the perception that their social needs are not met by desired quantities or qualities of social interactions (see Peplau & Perlman, 1982; Russell et al., 1980). Loneliness can be situational, an experience that happens at a given moment in one's life, or chronic, where one feels lonely for a prolonged duration of time (de Jong Gierveld, 1998; Young, 1982).
Data from the European Social Survey shows that 30 million Europeans (approximately 7%) report to feel lonely, with higher rates of loneliness reported by individuals who experience poor health, live alone, are widowed, earn a low income or are unemployed, and live in Eastern or Southern Europe (d’Hombres et al., 2018; Yang & Victor, 2011). Differences in rates of loneliness between males and females or those who live in rural or urban areas were found to be minimal. Other studies and reviews have shown loneliness to be associated with poor physical and mental health, including poor cardiovascular health, cancer, dementia, depression, anxiety, suicide ideation, suicide attempts, low wellbeing, and substance use (Beutel et al., 2017; Deckx et al., 2014; Leigh-Hunt et al., 2017). High levels of loneliness have also been associated with all-cause mortality (Leigh-Hunt et al., 2017).

Despite the importance of better understanding how loneliness is associated with physical and mental health symptoms and disorders, and who is at greatest risk, demographic information pertaining to sexuality is often not collected (IOM, 2011; Westwood et al., 2020). Systematic exclusion of sexuality data from health research has resulted in a health knowledge deficit and a lack of evidence-based interventions, especially for loneliness, for sexual minority individuals. Here, sexual minority individuals are those who self-report having a sexual identity, orientation, or practice that is different from the majority of society (i.e., non-heterosexual) (Kann et al., 2016). This may include, but is not limited to lesbian, gay, bisexual, transgender, queer or questioning individuals (LGBTQ+) (The Centre, 2020). Therefore, direct comparisons that investigate health inequities between sexual minority and heterosexual individuals are essential and needed (Westwood et al., 2020).

Research pertaining to loneliness amongst sexual minority individuals from Canada has shown that approximately 13-24% of sexual minority men experience loneliness most or all of the time (Salway et al., 2020). Other cross-sectional work has shown that loneliness amongst sexual minority individuals to be 34.7% (Kneale, 2016).

Amongst sexual minority individuals, loneliness is associated with poor mental health amongst youth and adolescents (Westefeld et al., 2001; Yadegarafard et al., 2014), adults (Mereish & Poteat, 2015), and older adults (D’Augelli et al., 2001). Comparisons between age ranges has shown sexual minority individuals who are older to report the highest levels of loneliness (Hughes, 2016). Loneliness has also shown to be associated with experiences of rejection and discrimination (Kuyper & Fokkema, 2010), feelings of internalized homophobia and low optimism (Jacobs & Kane, 2012), lower body satisfaction (Chaney, 2008), and higher engagement in risky sexual behaviors (Martin & Knox, 1997). Additionally, sexual minority
individuals who lack close relationships, including stable partners, experience higher rates of loneliness (Fish & Weis, 2019; Fokkema & Kuyper, 2009; Grossman et al., 2000; Hyun-Jun & Fredriksen-Goldsen, 2016).

Although some studies evidence prevalence rates of loneliness amongst sexual minority individuals to be higher when compared to heterosexual individuals (e.g., Kneale, 2016; Salway et al., 2020), no systematic approaches to examine and compare the literature have been taken. Furthermore, no aggregated, meta-analytic approaches have been made to directly compare self-reported loneliness between sexual minority and heterosexual individuals. As a result, this comparative meta-analysis aimed to examine loneliness between sexual minority and heterosexual individuals.

**Methods**

This comparative meta-analysis adhered to PRISMA guidelines to ensure methods and results were reported in a transparent and comprehensive manner (Moher et al., 2009).

**Search strategy and selection criteria**

A systematic search strategy was developed by both PG and FF. To identify studies, published studies were searched from the following databases MEDLINE, CINAHL, PsychINFO, Scopus, and Cochrane from inception to September 2020. No limits were imposed on study dates. We applied the following filter (where applicable): English. The search strategy is presented in Table 1.

**Study inclusion**

Studies were included in the meta-analysis if they met the following criteria:

1. Published in full in English;
2. Compared sexual minorities and heterosexuals;
3. Included a measure of loneliness; and
4. Presented quantitative data.

<table>
<thead>
<tr>
<th>Terms</th>
<th>Records</th>
</tr>
</thead>
</table>
**Study exclusion**

Studies were excluded if they were not published in English; did not provide an appropriate control sample (i.e., sexual minorities or heterosexuals); did not report a quantitative measure of loneliness; or used a qualitative design. Gray literature, including review articles, book chapters, books, dissertations, and conference abstracts, was also excluded. Where studies did not provide full details of loneliness results, an email was sent to the corresponding author. Both authors screened the articles independently to assess study eligibility. The authors met and confirmed study eligibility. Discrepancies between the authors over study eligibility were resolved through discussion until an agreement was achieved.

**Data extraction**

Data was extracted by both authors independently. The authors met afterwards to ensure all necessary data was extracted. Standardized data collection forms were used in order to report the following data:

1. Year of publication, country, sample size, age, gender, sex, and sexuality.
2. Loneliness: (i) scale used and data collection methods, and (ii) outcomes, including means and standard deviations.

**Data analysis**

Raw data (mean, standard deviations, and n) were sourced for loneliness. Effect sizes were calculated through the standardized difference in means (d), as this could have been calculated across different measures of loneliness used in different studies. Overall, effect sizes were pooled across included studies in order to calculate a weighted estimate with 95% CIs. All statistical analyses were conducted using OpenMetaAnalyst (Wallace et al., 2009). Random-effects models were applied to this meta-analysis to account for heterogeneity (DerSimonian & Laird, 1986). Cochran’s Q was used to assess variance between studies. Variance between studies was reported as $I^2$. The degree of potential publication bias was assessed by a funnel plot.

**Risk of bias**

To describe the risk of bias of the included studies, an 8-item tool for cross-sectional studies was used (Hoy et al., 2012). The tool assessed the
internal and external validity of each study and provided an overview of the main methodological characteristics. Risk of bias was assessed by each author independently. Overall agreement between the authors was 100%.

Results

Literature search

The PRISMA search process is presented in Figure 1. The database search returned 502 articles. Of the 502 articles, 129 duplicates were removed and 373 articles were screened. In total, 339 articles did not meet inclusion criteria and 34 full-text articles were assessed for eligibility. From these 34 articles, 30 were excluded for the following reasons: no heterosexual

Figure 1. PRISMA flow diagram.
comparison group (n = 25); not possible to distinguish populations (n = 2); and incomplete data (e.g., means, SD) (n = 3). A list of full-text excluded articles can be seen in Table 2.

In total, 4 articles were included in the review, reporting data from 481 individuals who identified as sexual minorities and 4176 individuals who identified as heterosexual. Ages for both sexual minorities and heterosexuals ranged from 8 years to 92 years. Individuals who identified as girls, women, or female represented 72.2% of the total population under review (n = 4657, 67.2% (sexual minority), 72.3% (heterosexual)). Studies were conducted in USA (n = 3) (Beam & Collins, 2019; Keenan et al., 2018; Westefeld et al., 2001), and the UK (n = 1) (Rivers & Noret, 2008). Measures of loneliness included the UCLA Loneliness Scale Version 3 (Russel, 1996) and Loneliness and Social Dissatisfaction Scale (Asher & Wheeler, 1985). Rivers and Noret (2008) used one discrete item on loneliness, asking if participants felt lonely. Included study characteristics are presented in Table 3.

Overall, the included studies displayed a low risk of bias for both internal and external validity. The risk of bias results can be seen in Table 4. A generated funnel plot indicated no publication bias (Higgins & Green, 2011). The publication bias funnel plot can be seen in Figure 2.

**Table 2.** Full-text excluded articles with reasons.

<table>
<thead>
<tr>
<th>Article</th>
<th>Exclusion criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adam et al., 2011</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Busby et al., 2020</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>D’Augelli et al., 2001</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>DeLonga et al., 2011</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Dowshen et al., 2009</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Escher et al., 2019</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Fernández et al., 2007</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Fernández et al., 2009</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Grossman et al., 2000</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Halkitis et al., 2018</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Hidaka &amp; Operario, 2006</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Hughes 2018</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Hyun-Jun &amp; Fredriksen-Goldsen, 2016</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Jackson et al., 2019</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Kuyper &amp; Fokkema, 2010</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Martin &amp; Knox, 1997</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Martin &amp; Knox, 1997</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Miller et al., 1997</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Mustanski et al., 2011</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Operario et al., 2010</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Pando et al., 2017</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Parsons et al., 2003</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Parsons et al., 2005</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Roth et al., 2018</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Salway et al., 2020</td>
<td>No heterosexual comparison group</td>
</tr>
<tr>
<td>Rew et al., 2001</td>
<td>Not possible to distinguish populations</td>
</tr>
<tr>
<td>Nokes &amp; Kendrew, 1990</td>
<td>Not possible to distinguish populations</td>
</tr>
<tr>
<td>Fokkema &amp; Kuyper, 2009</td>
<td>Missing data</td>
</tr>
<tr>
<td>Kneale, 2016</td>
<td>Missing data</td>
</tr>
<tr>
<td>Siconolfi et al., 2013</td>
<td>Missing data</td>
</tr>
</tbody>
</table>
Table 3. Included study characteristics.

<table>
<thead>
<tr>
<th>Study and country</th>
<th>Sample size, gender, sex</th>
<th>Age</th>
<th>Sexuality</th>
<th>Loneliness scale and data collection methods</th>
<th>Loneliness outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keenan et al., 2018; USA</td>
<td>SM: 233 girls H: 1837 girls</td>
<td>SM: 8 years H: 8 years</td>
<td>SM: lesbian or bisexual</td>
<td>Loneliness and Social Dissatisfaction Scale (Asher &amp; Wheeler, 1985) Data collected as part of the Pittsburgh Girl Study, a longitudinal study of girls. Loneliness data collected at 8 years of age, and then sexuality data collected at 17-20 years of age.</td>
<td>SM: 6.3 (SD = 6.6) H: 4.8 (SD = 5.7)</td>
</tr>
<tr>
<td>Rivers &amp; Noret, 2008; UK</td>
<td>SM: 17 girls, 36 boys H: 17 girls, 36 boys</td>
<td>SM: 13.85 years (SD = 1.36) H: 13.81 years (1.24)</td>
<td>SM: stated being attracted solely or primarily to individuals of the same sex on a measure of current sexual attraction</td>
<td>One question on feeling lonely (1 not at all − 5 extremely) Data collected from 14 schools of youth in grades 7-9 included in a study of adolescent health and well-being in the UK in 2003.</td>
<td>SM:1.36 (SD = 1.52) H: 0.67 (SD = 1.09)</td>
</tr>
<tr>
<td>Westefeld et al., 2001; USA</td>
<td>SM: 23 women, 47 men H: 76 women, 65 men</td>
<td>SM: 18-29 years Overall: 19.2 mean years</td>
<td>SM: gay male, lesbian, bisexual</td>
<td>The UCLA Loneliness Scale (Version 3) (Russell, 1996). Data collected from on campus organizations for gay, lesbian, and bisexual students from five diverse colleges and universities. Control group sample came from one university.</td>
<td>SM:47.78 (SD = 9.74) H: 39.74 (SD = 11.12)</td>
</tr>
</tbody>
</table>

*SM: Sexual minority, H: Heterosexuals.
Table 4. Risk of bias assessment.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>External Validity</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1. Had the study's target population a close representation of the national population in relation to relevant variables, e.g. age, sex, occupation? (yes = 0; no = 1)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>2. Was the sampling frame a true or close representation of the target population? (yes = 0; no = 1)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Was some form of random selection used to select the sample, or was a census undertaken? (yes = 0; no = 1)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>4. Was the likelihood of non-response bias minimal? (yes = 0; no = 1)</td>
<td>Unclear</td>
<td>Yes</td>
<td>Unclear</td>
<td>Unclear</td>
</tr>
<tr>
<td>Internal Validity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Were data collected directly from the subjects (as opposed to a proxy)? (yes = 0; no = 1)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>6. Was an acceptable case definition used in the study? (yes = 0; no = 1)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>7. Was the study instrument that measured the parameter of interest shown to have reliability and validity (if necessary)? (yes = 0; no = 1)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>8. Was the same mode of data collection used for all subjects? (yes = 0; no = 1)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Figure 2. Publication bias funnel plot.

Figure 3. Forest plot for loneliness sexuality minorities and non-sexual minorities.
The 4 studies showed that individuals who identified as sexual minorities (n = 481) reported higher ratings of loneliness than individuals who identified as heterosexuals (n = 4105) ($d = 0.352$, $p = 0.019$). There was substantial heterogeneity detected ($Q = 20.843$, $p < 0.001$, $I^2 = 85.61\%$) (Figure 3).

**Discussion**

The purpose of this comparative meta-analysis was to examine whether a difference in loneliness existed between sexual minority and heterosexual individuals. Overall, results from this meta-analysis show that sexual minority individuals are more likely to report feelings of loneliness than heterosexual individuals. Results illustrate that a small to medium effect size exists with regards to loneliness and identifying as a sexual minority individual. This effect was seen across a wide range of ages, from children to individuals who are older. This is the first meta-analysis to quantitatively aggregate comparative findings on loneliness between individuals who identify as sexual minorities and heterosexuals.

The results of this meta-analysis reinforce and support the findings of previous qualitative reviews that have investigated loneliness amongst sexual minority individuals (Fish & Weis, 2019; Freedman & Nicolle, 2020; Garcia et al., 2020). Given loneliness is associated with poor physical, mental, and social health, and that sexual minority individuals are at higher risk of reporting to be lonely, interventions need to distinctly address the specific needs of this population. Such needs may be addressed across individual, social, and structural dimensions (Garcia et al., 2020; Westwood et al., 2020).

Previous research, which has also investigated concepts of social isolation amongst younger as well as older sexual minority individuals (Fish & Weis, 2019; Garcia et al., 2020), has shown that the creation of enabling environments that are identity safe and foster social connectedness may be most beneficial in helping individuals address loneliness.

Regarding younger sexual minority individuals, Garcia et al. (2020) showed in their review that social connectedness in the LGBTQ+ communities was associated with higher feelings of wellbeing, self-esteem, self-acceptance, and self-worth and value. It was also found to be associated with lower levels of internalized homophobia. The creation of enabling environments, ones that were identity-safe spaces be they in person or online, provided opportunities for relationship building and support for dealing with rejection and isolation. For younger individuals, Genders and Sexualities Alliances (GSAs) may play an important role in helping sexual minority individuals develop a sense of self and belonging within a community. A sense of belonging has been shown to be a
protective factor against loneliness (Baumeister & Leary, 1995; Mellor et al., 2008).

Amongst older sexual minority individuals, stronger and larger social networks that aim to create a sense of belonging have also been shown to have a positive impact on addressing loneliness (Fish & Weis, 2019). Specifically, creating built spaces, like bars, clubs, and cafes, for people to come together (Kneale, 2016); creating affinity or activity groups (Ceatha et al., 2019; Wilkens, 2015); and participating in formal and informal social events or rituals that shape social and cultural identity (Glass & Few-Demo, 2013). Furthermore, living in close proximity to friends in one's neighborhood has also been found to be associated with increased frequency of contact, increased feelings of belonging, and decreased loneliness (Green, 2016). Green (2016) found that overall, LGBT adults in comparison to heterosexual adults were more likely to have weaker social networks, where they were less likely to have any social contact and receive informal support. Similar findings were made by Kneale (2016), that showed that LGB people in comparison to heterosexual individuals have higher rates of renting housing in the private sector and lower rates of home ownership (Kneale, 2016), thus creating the potential for housing instability and frequent needs to move. Additionally, LGB people were more likely to experience income inequality, especially at lower income ranges. Both income and housing instability have been associated with reported feelings of loneliness (Kneale, 2016). Support for and access to affordable housing, across adulthood, needs to be a priority for sexual minority individuals as it has been shown to be a key determinant of mental and physical health (Garnham & Rolfe, 2019). To address the need for affordable and inclusive housing, arguments have been made for the creation of LGBTQ+ specific care homes for older sexual minority individuals (King & Stoneman, 2017).

Last but not least, loneliness has been found to be related to minority stress factors such as experiences and expectations of stigmatization that have an impact on mental and physical health (Mereish & Poteat, 2015). Hence, it has been suggested that interventions to decrease societal sexual prejudice (Kuyper & Fokkema, 2010), and recognition of sexual minority rights, can positively impact on feelings of loneliness (Stojanovski et al., 2015).

**Clinical significance**

Because of the limited number of studies included in the meta-analysis, evaluations of loneliness amongst different genders and sexes, age groups, and ethnicities was not possible. As indicated by Westwood et al. (2020),
there is a need to establish a mental health research agenda to address health inequalities amongst sexual minority individuals. Specifically, the need for comparative data to better understand health inequalities in comparison to non-sexual minority individuals so that deficits in health and healthcare services can be identified and addressed through specific interventions (Jennings et al., 2019). Results from the National LGBT Survey in the UK found that of those individuals who tried to access mental health services, 50% did not find the process easy. Individuals surveyed stated they encountered stigma and discrimination throughout the process with 22% indicating they dealt with unsupportive general practitioners (Government Equalities Office, 2018). Previous research has shown that LGBT individuals, in comparison to heterosexuals, were more likely to delay health care use (Jennings et al., 2019). The collection of demographic data on sexuality and gender is essential for the development of future interventions and services that are accessible to sexual minority individuals (Gorczynski & Brittain, 2016; Gorczynski & Fasoli, 2020). To integrate evaluations and services about loneliness into clinical practice, clinicians will have to consider the therapeutic relationships they have with their patients (Campaign to End Loneliness, 2015). For instance, clinicians should consider how to approach the topic of loneliness with their patients, be it through in-person and open discussions or through pre-appointment self-administered brief questionnaires like the Three-Item Loneliness Scale (Hughes et al., 2004). Clinicians should consider how suitably trained they are to evaluate and discuss loneliness especially in the context of their patients’ sexuality and gender. Clinicians will require training in evaluations and discussions of loneliness and will require support from their colleges and organizational bodies as well as local health and voluntary sectors to ensure that their patients’ loneliness is acknowledge and addressed in a meaningful manner. Clinicians should also consider how they can devote sufficient time to the initial and on-going evaluations of loneliness with their patients. Lastly, clinicians should consider what resources and services they can provide to their patients.

**Limitations**

Despite a robust search and evaluation of all included articles, a number of limitations should be addressed. First, efforts were made to contact the study authors of excluded studies where limited data was published. Such information may have led to the inclusion of studies in the meta-analysis and expanded our understanding of loneliness between sexual minority and heterosexual individuals. In the future, researchers should make every effort to publish full results to minimize publication bias. Ultimately, the
limited number of included studies may limit the overall generalizability of our findings. In particular, data referred mostly to USA and it would be interesting to compare data from countries varying on attitudes toward sexual minorities and LGBTQ+ rights (ILGA, 2020). Second, Rivers and Noret (2008) did not use a valid or reliable measure of loneliness in their study. Instead, they assessed loneliness through the use of a single question. Overall, the Rivers and Noret (2008) study exhibited a higher risk of bias than other included studies and their results must be viewed with caution. Lastly, there was substantial heterogeneity detected in our comparative meta-analysis. Overall, studies included populations of sexual minorities that differed in age and how individual chose to self-identify their sexuality (e.g., sexual minority vs current/previous same sex relationship vs LGBTQ+). Additionally, different measures of loneliness were used which may have further limited the generalizability of the results. Also, limited data was available concerning race and ethnicity. Future longitudinal research needs to be mindful as to what demographic data is collected (i.e., information concerning multiple protected characteristics), how loneliness is measured (i.e., through reliable and valid measures), the temporal nature of loneliness (i.e., temporary or chronic), and how loneliness is contextualized (i.e., is it the result of social exclusion or a public health emergency). Researchers should also investigate how clinicians can best meet the needs of patients with respect to their loneliness. Such evidence is essential in the construction of any intervention that will be culturally competent and contextually well-suited.

Overall, the results of our meta-analysis show that sexual minority individuals were more likely to report feeling lonely than heterosexual individuals. Given the limitations of included studies, researchers should aim to be inclusive of demographic information that may lead to a better understanding of loneliness amongst sexual minority and heterosexual individuals and address publication biases that may limit the generalizability of findings. Nevertheless, our findings contribute to the recent work on loneliness among sexual minority individuals (Fish & Weis, 2019; Freedman & Nicolle, 2020; Garcia et al., 2020) and suggest the need to consider interventions at the individual and societal level to decrease the loneliness experienced by sexual minorities. This is the first paper to provide quantitative aggregated data on loneliness that covers the life span, from children to older individuals, amongst sexual minorities. Such data will allow for the comparison of future data and aid in policy and intervention development.

Disclosure statement

No potential conflict of interest was reported by the authors.
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Fabio Fasoli http://orcid.org/0000-0002-8043-1630

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