











# Loneliness and the sexual behavior of sexual minority men in the context of the COVID-19 pandemic

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## Abstract

In March 2020, in response to the COVID-19 pandemic, Canadian provincial governments instituted a variety of public health measures that included social distancing and isolation, which may have had unintended consequences. According to the Loneliness and Sexual Risk Model, gay, bisexual, and other men who have sex with men (GBM) often cope with loneliness through risky sexual behaviors. Previous studies have demonstrated that COVID-19 measures such as social distancing and isolation led to increases in loneliness; thus, these measures may also have led to elevated sexual risk-taking among some GBM. Participants were recruited from an ongoing cohort study on GBM health and well-being, and were included in the current analysis if they had completed relevant study questions ( $n = 1134$ ). GBM who reported lower levels of social support pre-COVID-19, were younger, and lived alone each reported greater loneliness during the first year of COVID-19. Although feelings of loneliness did not predict sexual risk-taking within the first year of COVID-19, loneliness

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did predict greater sexual risk-taking 6 months later. Additionally, younger GBM and those living alone were more likely to engage in sexual risk-taking at both COVID-19 data collection points. These findings offer some support of the Loneliness and Sexual Risk Model; however, it is possible that the unique circumstances of the COVID-19 pandemic resulted in a temporary suspension of this association, as many GBM took steps to protect themselves and partners in the context of COVID-19.

#### KEYWORDS

COVID-19, loneliness, MSM, sexual health

## 1 | INTRODUCTION

Sexual minority populations are at elevated risk for loneliness due to experiences of exclusion and stigmatization from family and peers (Gorczyński & Fasoli, 2022; Meyer, 2003; Mongelli et al., 2019; Tan & Saw, 2022)—a problem that was only exacerbated during the COVID-19 pandemic. Because strict measures were implemented to stem the spread of COVID-19, sexual minority individuals may have lost access to crucial support systems that mitigate the adverse effects of loneliness (Al-Khouja et al., 2021; Hart et al., 2017; Hsieh, 2014; Skakoon-Sparling et al., 2021; Wang et al., 2018; Xu et al., 2020). Loss of these support systems and subsequent feelings of loneliness may have unintended consequences in terms of risk-taking behaviors for this population. The Loneliness and Sexual Risk Model (Torres & Gore-Felton, 2007) posits that gay, bisexual, and other men who have sex with men (GBM) engage in greater sexual risk-taking as a means for coping with loneliness. Among GBM, loneliness has often been associated with engaging in compulsive sexual partner-seeking and sexual risk-taking, such as condomless anal sex with strangers (e.g., Chaney & Burns-Wortham, 2015; Hubach et al., 2012, 2015; Su et al., 2018). Thus, we examined whether loneliness among GBM predicted greater sexual risk-taking during the COVID-19 pandemic.

### 1.1 | Loneliness and sexual risk-taking among GBM

Greater feelings of loneliness (relative to heterosexual counterparts) are believed to be directly related to the unique identity-related stressors experienced by GBM (Gorczyński & Fasoli, 2022; Kuyper & Fokkema, 2010; Mereish & Poteat, 2015; Mongelli et al., 2019; Tan & Saw, 2022). As a result of heterosexism, GBM can experience rejection and distance themselves from family and peers (van Veelen et al., 2020), adversely affecting the quality of their relationships and the social support they receive from others (Beals et al., 2009; Skakoon-Sparling et al., 2022; Weisz et al., 2016), leading to greater levels of loneliness and isolation (Puckett et al., 2015; Robinson, 2018).

GBM and other sexual and gender minority individuals have developed many coping mechanisms to buffer against the adverse effects of sexual minority stressors. At the structural level, exclusion and discrimination led to the formation of “gayborhoods”—neighborhoods consisting primarily of LGBTQ+ individuals and businesses—where community members can gather and form new bonds and connections with one another (Aldrich, 2004). At the individual level, GBM seek out social/sexual connections to mitigate feelings of loneliness. These behaviors, however, can become maladaptive if they result in sexual behaviors that put one's health at risk (e.g., increasing risk for sexually transmitted infections; STIs).

## 1.2 | Unique stressors GBM face in COVID-19

Although the various and shifting COVID-19 public health measures affected everyone, GBM may have been particularly susceptible to the adverse effects of social isolation and distancing (e.g., Nowaskie & Roesler, 2022). Compared to cis-heterosexual individuals, GBM are more likely to rely on their friendship networks, rather than their families, for social support (e.g., Frost et al., 2016). Further, because businesses were shuttered and people were encouraged to interact only with individuals in their immediate households, many GBM lost access to local venues used to build social connections and receive social support from others (Rodriguez-Seijas et al., 2020; Sanchez et al., 2020). Indeed, among sexual minority groups (compared to cis-heterosexual) there have been significantly lower levels of perceived social support (e.g., Moore, Wierenga, et al., 2021) and higher rates of loneliness (Herrmann et al., 2023) in the context of COVID-19.

Within GBM communities, COVID-19 lockdowns may also have differential effects by age. Younger GBM may have been more severely impacted by lockdowns that restricted their access to other members of their community and other peer networks (e.g., via the shift to remote learning, loss of employment, and loss of local venues including LGBT-friendly businesses and community outreach centers), inadvertently increasing their feelings of isolation and loneliness (Bu et al., 2020; Fish et al., 2020; Gonzales et al., 2020; Sanchez et al., 2020). Though many GBM adopted various preventative measures to continue engaging in sex within their own social bubbles, particularly in the early phases of the COVID-19 pandemic (e.g., Daroya et al., 2022, 2023), loneliness was the most commonly reported motivation for engaging in casual sex with someone from outside their household (Hyndman et al., 2021). This may be particularly problematic for younger GBM, as they are simultaneously more likely to engage in condomless anal sex, while also being less likely to utilize pre-exposure prophylaxis (PrEP) to prevent contracting HIV relative to older GBM (Holt et al., 2022).

## 1.3 | The present study

We explored changes in sexual behavior (specifically number of new sex partners and risky sexual behavior) due to the COVID-19 pandemic as a function of loneliness, isolation, and age. We hypothesized that (1) higher levels of loneliness would be associated with increased sexual risk-taking, (2) younger GBM would report higher levels of loneliness and sexual risk-taking than older GBM, and (3) that age would moderate this relationship such that younger GBM with higher loneliness would engage in more sexual risk-taking than older lonely GBM. We also hypothesized (4) that we would observe longitudinal changes in the number of new sexual partners GBM report over time.

## 2 | METHODS

### 2.1 | Data and participants

The current study uses data from the COVID-19 sub-study of the Engage Cohort Study, an ongoing longitudinal study of GBM in Canada's three largest urban centers (Cox et al., 2021; Hart et al., 2021; Moore, Cui, et al., 2021). Participants were recruited from 02/2017 to 08/2019 and completed study visits at enrollment and every 6–12 months afterwards. Participants were included in the current analysis if (i) they completed a study visit within 12 months prior to the Canadian COVID-19 lockdowns (03/2019–3/2020), (ii) and completed the relevant study measures in the first (COVID1, 09/2020–02/2021) and second (COVID2, 02/2021–03/2022) COVID-19 modules. Demographic characteristics of participants are shown in Table 1.

## 3 | MATERIALS AND PROCEDURE

For each study visit, participants completed a computer-assisted questionnaire, which included questions about well-being-related attitudes and behaviors. In all three visits relevant to this study (pre-COVID, COVID1, and

TABLE 1 Demographics summary and descriptive statistics.

	COVID1 (n = 1177)	COVID2 (n = 1065)
Age <i>M(SD)</i>	41.40 (13.12)	42.35 (13.17)
Living alone	45%	44%
HIV negative/unknown	81%	81%
Financial strain <i>M(SD)</i>	6.78 (2.39)	6.6 (2.35)
Postsecondary educated	86.80%	87.50%
Loneliness <i>M(SD)</i>	3.74 (0.89)	3.58 (0.97)
Engaged in sexual risk-taking	53.70%	54.00%
Emotional support <i>M(SD)</i>	3.32 (1.73)	3.66 (1.82)
COVID-19 anxiety <i>M(SD)</i>	5.21 (2.55)	-
Adherence to public health guidelines	-	4.14 (1.04)
Intended to avoid sex outside household	-	29.60%
Intended to reduce sex outside household	-	32.30%

COVID2), participants reported the number of new male sex partners within the past 6 months. To assess sexual risk-taking during the COVID-19 pandemic, at COVID1 and COVID2 participants were asked whether they had sex with new sex partners, engaged in one-time sexual encounters, engaged in transactional sex (trading sex for money or drugs), or visited a bathhouse or group sex event in the past 6 months. Sexual risk taking was encoded as a binary variable, where participants who engaged in any of the aforementioned activities were encoded as "1." At COVID1 and COVID2 participants also self-reported their feelings of loneliness using a 3-item version of the UCLA Loneliness Scale (Hughes et al., 2004), with a 5-point Likert response scale such that higher scores indicated greater feelings of loneliness. Self-perceived social support pre-COVID was assessed using the Social Support Survey Instrument (Hays et al., 1995), and with a single item in both COVID modules ("how often have you received emotional support from friends or loved ones?": 1 "never"–6 "every day"). Finally, at COVID1 participants were asked about COVID anxiety ("COVID-19 makes me feel:" 1 "not at all anxious"–10 "completely anxious"), and at COVID2 they were asked whether they felt able to follow local public health guidelines; responses ranged from 1 ("strongly disagree") to 5 ("strongly agree"). Participants also reported demographic information including age, living situation, HIV status, education, and financial strain (Financial Strain Index; Hamby et al., 2011). Full details of the measures can be found in the Supporting Information S1 (<https://osf.io/ebu2w>); see Table 1 for descriptive statistics.

## 4 | RESULTS

### 4.1 | Loneliness

We used linear regression to model how age, living situation, and social support were associated with loneliness during the COVID-19 pandemic (Table 2). At both COVID time points, younger GBM and those who lived alone reported greater feelings of loneliness compared to older GBM and those who did not live alone (in line with H2). Although greater social support pre-COVID predicted lower loneliness scores at COVID1, COVID1 social support did not predict loneliness scores at COVID2. These differences, however, may be due to changes in how social support was measured at each time-point.

TABLE 2 Loneliness during COVID-19 as a function of age, living situation, and social support.

	B (SE)	Beta	p	95% CI
COVID 1 (2020/09–2021/02)				
Age	-0.01 (.01)	-.143	<.001	-0.02, -0.01
Living alone	0.21 (.06)	.118	<.001	0.10, 0.33
Pre-COVID social support	-0.19 (.03)	-.183	<.001	-0.25, -0.12
F(p)	11.44 (<.001)			
R <sup>2</sup> <sub>adj</sub>	.086			
COVID2 (2021/02–2022/03)				
Age	-0.01 (.01)	-.070	.040	-0.01, -0.00
Living alone	0.26 (.06)	.136	<.001	0.14, 0.38
COVID1 social support	0.05 (.02)	.009	.786	-0.03, 0.04
F(p)	7.68 (<.001)			
R <sup>2</sup> <sub>adj</sub>	.049			

Abbreviation: CI, confidence Interval.

## 4.2 | Sexual behavior during COVID

### 4.2.1 | Number of new sex partners

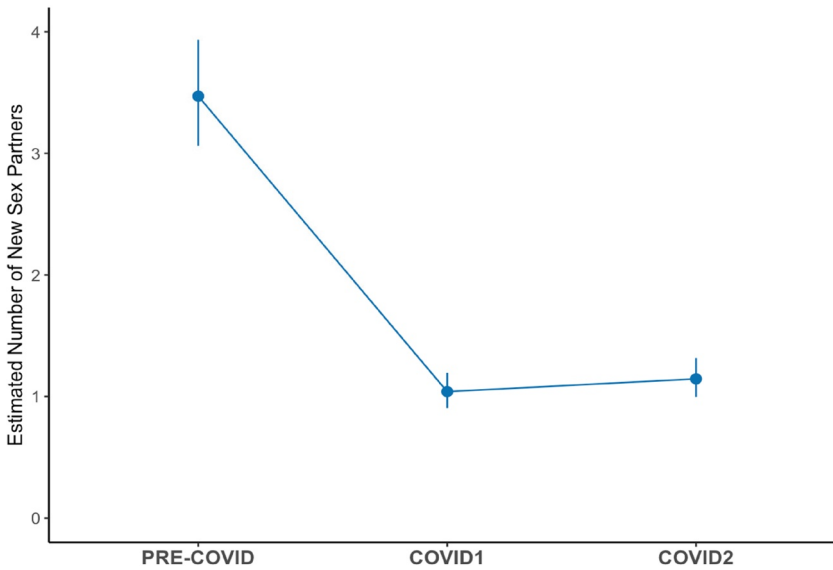
We modeled the number of new male anal sex partners (subsequently referred to as “new sex partners”) to investigate the extent to which participants engaged in new relationships outside their existing social circles after the onset of the COVID-19 pandemic. Only participants who reported the number of new partners at all three time points ( $n = 1082$ ) were included in the analysis. To account for zero-inflated count data and overdispersion, we used a zero-inflated negative binomial mixed effects regression to model changes in the number of new sex partners over time, with time points clustered within participants for the conditional model. Consistent with hypothesis 4, participants reported significantly fewer new sex partners at COVID1 relative to pre-COVID,  $b = 1.20$ , 95% CI [1.08, 1.32]. Although there was a slight increase in the reported number of new sex partners at COVID2, relative to COVID1, this difference was non-significant,  $b = 0.10$ , 95% CI [-0.03, 0.22] (Figure 1).

### 4.2.2 | Sexual risk-taking

Logistic regression was used to model the effects of loneliness, age, and living situation on sexual risk-taking at COVID1 and COVID2 (Table 3), with COVID2 incorporating loneliness at both the current time point and 6 months earlier. We found inconsistent support for the Loneliness and Sexual Risk Model (Torres & Gore-Felton, 2007), as loneliness at COVID1 was not associated with sexual risk-taking at COVID1, but did predict sexual risk-taking 6 months later, at COVID2 (thus supporting H1 at COVID2, but not COVID1). Current feelings of loneliness at COVID2 also predicted sexual risk-taking at COVID2. Contrary to our hypotheses (H3), age did not moderate the association with loneliness at either time point (COVID1: beta =  $-.009$ ,  $p = .187$ ; COVID2: beta =  $.002$ ,  $p = .665$ ). However, at both time points, younger GBM and those living alone were more likely to engage in risky sexual behavior (in line with H2).

## 4.3 | Exploratory analyses

We investigated possible alternative explanations for sexual risk-taking during COVID-19. Because older individuals were at greater risk of severe COVID-19 infections, they may have been less likely to ignore lockdown measures



**FIGURE 1** Estimated marginal means of the number of new sex partners over time, accounting for zero-inflated distribution.

**TABLE 3** Factors associated with sexual risk-taking at COVID1 and COVID2.

	B (SE)	OR	p	95% CI
<b>COVID 1 (2020/09–2021/02)</b>				
Age	−0.02 (.01)	0.99	.002	0.97, 0.99
COVID1 loneliness	0.03 (.07)	1.03	.684	0.90, 1.18
Living alone	0.49 (.13)	1.62	<.001	1.26, 2.08
Model $\chi^2(p)$	37.33 (<.001)			
N.R <sup>2</sup>	.042			
<b>COVID2 (2021/02–2022/03)</b>				
Age	−0.02 (.01)	0.98	<.001	0.97, 0.99
COVID1 loneliness	0.16 (.08)	1.17	.026	1.01, 1.36
COVID2 loneliness	0.24 (.08)	1.27	.002	1.10, 1.48
Living alone	0.30 (.14)	1.35	.026	1.04, 1.76
Model $\chi^2(p)$	49.53 (<.001)			
N.R <sup>2</sup>	.062			

*Note:* Standardized residuals were used for loneliness scores in the COVID2 sexual risk-taking analyses to prevent multicollinearity. See Supporting Information S1 for individual analyses.

Abbreviations: CI, confidence interval; OR, odds ratio.

to engage in sexual activity. Additionally, those who lived with other people may have been more concerned about potentially spreading COVID-19 within their households, and thus less likely to engage in sexual risk-taking behavior. To address this possibility, we examined differences in COVID-19 anxiety (measured in the COVID1 module) and adherence to public health guidelines (measured in the COVID2 module). There were no differences in COVID-19 anxiety as a function of age ( $\beta = -.033$ ,  $p = .283$ ) or living situation ( $\beta = -.053$ ,  $p = .060$ ). However, older GBM reported less difficulty in adhering to public health guidelines ( $\beta = .097$ ,  $p = .005$ ).

We included COVID-19 anxiety as a factor in the regression model for COVID1 sexual behavior and found that there was no association with sexual risk-taking (OR = 0.98,  $p = .481$ ). Similarly, when we included adherence to public health guidelines in the COVID2 sexual behavior model, there was also no significant association (OR = 0.89,  $p = .072$ ).

## 5 | DISCUSSION

We found evidence that the COVID-19 pandemic created unique circumstances where the Loneliness and Sexual Risk Model was temporarily unable to predict sexual behavior based on loneliness. GBM in our sample likely adjusted their sexual behaviors in response to early concerns about COVID-19. Feelings of loneliness (past and recent), however, predicted higher levels of sexual risk-taking at COVID2, which ultimately supports hypothesis 1. Combined with the overall decline in new sexual partners, this suggests that GBM likely adapted their sexual activity in line with COVID-19 concerns/public health guidelines. That is, despite increased feelings of loneliness, many GBM restricted their number of new sexual partners and were less likely to engage in sexual risk-taking in the first year of COVID-19. This initial drop followed by a gradual increase in sexual behavior is consistent with other work tracking the sexual behavior of GBM during COVID-19 in Australia (Storer et al., 2022).

Consistent with hypothesis 4, we found that GBM reported fewer new sexual partners during COVID-19 compared to the months prior. This fluctuation over time likely reflects the shifting context surrounding health behaviors and COVID-19. In interviews from the qualitative arm of our study, GBM discussed adapting their sexual behaviors in response to COVID-19 by engaging in sex within only a select group of individuals, masking during sex, and engaging in outdoor sex and voyeurism (Daroya et al., 2022). Our quantitative data likely reflects the strategy of limiting sexual encounters with new partners during the early phases of the COVID-19 pandemic, and gradually engaging in more sexual encounters as public health guidelines loosened and vaccines became more available.

Although some pre-COVID-19 research suggests that loneliness is a more significant issue for older GBM (e.g., Jacobs & Kane, 2012), we found the opposite trend in our study. That is, in the context of COVID-19, younger GBM persistently reported feeling more lonely, consistent with hypothesis 2 and other research among general samples during the COVID-19 pandemic (e.g., Groarke et al., 2020; Lisitsa et al., 2020). This suggests that younger GBM may have been less well-equipped to adaptively cope with the social isolation resulting from COVID-19-related restrictions. We also observed a decreased likelihood of engaging in sexual behavior and a corresponding increased likelihood of reporting intentions to reduce or abstain from sex with partners outside one's household among older GBM in the context of COVID-19. Thus, although we saw an overall decrease in sexual activity during the first year of the COVID-19 pandemic among all GBM in this sample, loneliness did indeed lead to increased sexual behavior later.

In the current work, we found increased loneliness and increased sexual risk-taking among younger GBM. This is in line with other work showing decreased condom use among younger sexual minority men during the COVID-19 pandemic (Souleymanov, et al., 2023). Given these findings, younger GBM may need additional support for coping with feelings of loneliness in ways that do not increase their risk for the transmission of infection (be it COVID-19, MPox, or other STIs, including HIV). Further qualitative and quantitative work is needed to better understand why younger GBM may be more severely affected by feelings of loneliness.

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## CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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