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Use of HIV pre-exposure prophylaxis (PrEP) associated with lower HIV anxiety among gay and bisexual men in Australia who are at high risk of HIV infection: Results from the Flux Study.

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Abstract

Background

Many gay and bisexual men (GBM) experience HIV anxiety, particularly around condomless anal intercourse (CLAI). HIV pre-exposure prophylaxis (PrEP) is an effective HIV prevention strategy that may reduce HIV anxiety among GBM.

Methods:

The *Following Lives Undergoing Change* (Flux) Study is a national, online, open prospective observational study of licit and illicit drug use among GBM in Australia. In 2018, participants responded to newly included items regarding anxiety about HIV transmission. Stratifying GBM as high or low risk as determined by the Australian PrEP Guidelines, we assess whether PrEP use is associated with lower levels of HIV anxiety. Multivariate logistic regression was used to compare factors associated with PrEP use among GBM at high risk (PrEP-eligible) and low risk (PrEP-ineligible) of HIV infection. Results are reported as adjusted odds ratios (aOR) and corresponding 95% confidence intervals (95%CI).

Results:

Among 1547 men, mean age was 37.1 years (SD 13.1). Men aged 25 years or younger had higher HIV anxiety scores than older men. Among PrEP-eligible men, men who use PrEP reported lower levels of HIV anxiety (aOR=0.92; 95%CI=0.87-0.99; p<0.001). No differences were observed on HIV anxiety among PrEP-ineligible men.

Conclusions:

Among PrEP-eligible men, PrEP use was independently associated with lower levels of HIV anxiety. In addition to avoiding HIV infection, PrEP use may help reduce anxiety among men at risk of HIV. This feature of PrEP could be promoted as part of demand creation initiatives to increase PrEP uptake.

Keywords: Anxiety, PrEP, pre-exposure prophylaxis, HIV, HIV anxiety, gay and bisexual men

Introduction

HIV diagnoses among gay and bisexual men (GBM) have been stable or increasing in many countries for over a decade.[1] In some settings, recent reductions in new diagnoses have been attributed to high uptake of HIV pre-exposure prophylaxis (PrEP),[2] and increased uptake of HIV treatment uptake among people diagnosed with HIV.[3] PrEP has been shown to be highly effective in reducing risk of HIV infection among GBM.[4] Despite high effectiveness, in many settings, awareness and uptake of PrEP among GBM at high risk of HIV infection has been low.[5-7] Anxiety about HIV affects many GBM,[8] compromising their emotional well-being and creating barriers to HIV testing.[9] PrEP may alleviate anxiety about HIV transmission.

In 2011, the US Centre for Disease Control and Prevention published interim PrEP guidelines which assisted in identifying people at high-risk of HIV, thereby identifying those eligible to access PrEP.[10] Guidelines for PrEP have been used nationally in Australia and internationally in implementation studies and to assist PrEP prescribing clinicians. According to Australian guidelines, GBM who report any of the following behaviours are considered at high-risk of HIV and deemed eligible to access PrEP: at least one episode of condomless anal intercourse with an HIV-positive regular partner not on treatment or with detectable viral load; receptive condomless anal intercourse with a casual partner; or recent methamphetamine use. GBM who meet any of these criteria are considered at high-risk of HIV (herein described as 'PrEP-eligible').[11] Whereas GBM who do not meet these criteria are considered at lower risk of HIV (herein described as 'PrEP-ineligible'). Given these differences in risk behaviour, anxiety about HIV transmission may differ between PrEP-eligible and PrEP-ineligible.

Experiencing anxiety was common among GBM in communities impacted by the AIDS epidemic in the 1980s and 1990s.[8,12] For many men, fear of HIV transmission led to anxiety about sex with other men, even in situations where transmission was not possible, such as

between men in sero-concordant monogamous relationships.[8] Many GBM remain anxious about HIV transmission, particularly in relation to condomless anal intercourse (CLAI) regardless of whether there is a risk of HIV transmission.[13-15] PrEP may reduce HIV anxiety among GBM, particularly among those who report HIV risk behaviours, such as CLAI.

Links between PrEP use and lower levels of HIV-related anxiety have been reported. Among GBM attending an HIV testing clinic in Toronto who were willing to use PrEP, a majority of men with high-risk sexual practices (69.8%) wanted to use PrEP to decrease anxiety about getting HIV.[6] Additionally, several qualitative studies among GBM have found that some men anticipated that taking PrEP would reduce their anxiety about sex with HIV-positive partners,[16-18] and found that many PrEP users report feeling safer during sex or reduced HIV anxiety.[19-24] Older PrEP users have reported relief from long-held fears about HIV that they had associated with sex with other men.[23] PrEP users have also reported increased sexual pleasure.[25] An Australian study among 242 GBM using PrEP found that 74% reported reduced HIV concern and increased sexual pleasure because of PrEP.[26] A recent longitudinal cohort study followed men for 24 months and found that among 137 GBM who initiated PrEP, sexual anxiety in general was lower after commencing PrEP.[25]

Despite qualitative findings that GBM often perceive PrEP as reducing anxiety about HIV risk and one small cohort study finding that PrEP use was associated with reduced sexual anxiety in a small sample of PrEP users, to our knowledge no studies have measured HIV-specific anxiety in a large sample of PrEP-eligible GBM. We investigate the relationship between PrEP use and HIV-related anxiety among GBM.

Methods

The *Following Lives Undergoing Change* (Flux) Study is a national, online, open prospective observational study among GBM in Australia. The study protocol has been published in greater detail previously.[27] In brief, participants were recruited between 2014 and 2018 through gay community websites and online media, Facebook, mobile phone applications, and gay sexual networking websites. Men were eligible to participate in the study if they: were at least 16 years and six months of age; identified as gay or bisexual, and/or had sex with a man in the last 12 months; and lived in Australia. At enrolment, participant details and online informed consent was obtained from all participants. Participants verified their enrolment through email receipt at enrolment. No compensation was offered for participation. Ethical approval was provided by the Human Research Ethics Committee of UNSW Sydney.

Measures

All questionnaires were completed online using computer-assisted self-interviewing software.[27] Items included age, education, sexual identity, and self-reported HIV serostatus. HIV-negative/untested men reported use of PrEP. Questions were mostly derived from previous research and response options were forced choice (checkboxes and radio buttons).[28,29]

Sexual behaviours in the previous six months were reported for sex with casual and regular partners.[30] Men also reported whether they engaged in group sex. A hierarchy of HIV risk for sexual behaviour was based on a previously-used classification system, ranging from lowest risk to highest risk; no sexual partners, no anal sex, consistent condom use, insertive only CLAI, and any R-CLAI.[31]

Reported behaviours were used to stratify participants as either PrEP-eligible (high-risk of HIV) or PrEP-ineligible (lower risk of HIV) according to the Australian PrEP Guidelines. Those Guidelines use a 3-month period to correspond with data collected in Australian clinic and medical settings.[11] However, the Health in Men (HIM) Study data that were used to inform the Australian PrEP Guidelines were based on a 6-month time period,[28] which is also commonly used in Australian behavioural research,[29] including in this study.

This project was not a PrEP trial, nor was knowledge of or access to PrEP a requirement for joining the study. Participants simply reported their sexual and drug using behaviours during their participation in the study. For those not using PrEP at baseline or thereafter, their behaviours before initiating PrEP were reported without any particular expectations about subsequent circumstances. Based on the behaviours reported, we categorised participants as high or low risk in accordance with the established Australian PrEP Guidelines. Participants were unaware of their subsequent risk categorization and their own perceived level of HIV risk was not assessed for this analysis.

Social engagement with gay men was assessed using a scale with two items (proportion of friends who are gay men, and amount of free time spent with gay male friends), with higher scores indicating greater social engagement with gay men.[32]

In 2018, three statements measuring the level of anxiety felt regarding HIV transmission were included: After having sex I sometimes get concerned that I might have done something risky; I sometimes worry about HIV before having sex; When I'm having sex HIV tends to come to mind. Men reported how much they agreed or disagreed with these statements on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree) (Table 1). The sum of these scores formed a measure of HIV anxiety with strong internal consistency (a=0.820) [table 1].

[Please insert TABLE 1 here]

Analysis

Data were analysed with SPSS™ version 25 software (IBM Corp, Armonk, NY, USA). Participants with missing data included in this analysis were recorded accordingly (e.g., did not answer.). All data were screened and statistical assumptions were assessed. Categorical variables were analysed using Pearson's chi-square test and t-tests were used for continuous variables. We used Type I error of 5% for these analyses. To assess statistical associations, we used logistic regression models and calculated adjusted odds ratios (aOR) and 95% confidence intervals (CI) to compare PrEP use among PrEP-eligible men, and again among PrEP-ineligible men. Associations with a p-value of less than 0.05 in bivariate analyses were included in the multivariate analyses. Associations with a p-value of <0.05 were retained in the final model.

Results

Participants and Sample

Since 2014, 2878 GBM had enrolled into the Flux Study. Analysis was restricted to GBM who had not tested HIV-positive and responded to the survey in 2018, thereby excluding 1331 respondents. Compared to the 1547 men included in the analysis, the 1331 men (46.3%) excluded from this analysis men were younger (Mean age 34.5 years vs 37.1 years; p<0.001), and less likely to have tested for HIV at baseline (20.8% vs 15.6%; p<0.001). Men who were excluded were less likely to identify as gay or homosexual (6.9% vs 9.6%; p=0.022) and less likely to report that most of their friends were gay men (26.8% vs 31.7%; p=0.002). Although the men who were excluded were no more or less likely to report behaviours that met the

eligibility criteria for PrEP at baseline, they had higher mean scores on the measure of generalised anxiety than did the 1547 men (5.76 vs 5.08; p=0.001) included in these analyses.

The mean age of the 1547 men who completed all items on the HIV anxiety scale was 37.1 years (SD 13.1). Most men (90.6%) identified as gay, while 33.3% said most or all of their friends were gay, with 20.5% spending 'a lot' of their time with them. Over half (63.7%) had attended university. Most (89.1%) had been tested for HIV. Over two-fifths (43.9%) reported being in a relationship with a regular male partner in the previous six months. One quarter (26.2%) had engaged in behaviours in the previous six months that meant they were eligible for PrEP: 20.7% reported R-CLAI with casual partners (R-CLAIC); 9.2% reported methamphetamine use; one man reported condomless sex with an HIV-positive regular partner whose viral load was detectable. Over one-third (37.2%) were using PrEP in the previous six months.

HIV anxiety

Half the men (51.6%) agreed that they sometimes had concerns about whether their sexual encounters were 'safe', and 52.5% agreed that they sometimes worried about HIV before sex [Table 2]. One quarter (25.9%) indicated that HIV comes to mind during sex.

Fifteen men (1.0%) 'strongly agreed' with all three items; 18.6% scored higher than 12 from the maximum of 18. The mean HIV anxiety score was 8.85 (SD=4.01). Younger men (25 years or less) had higher HIV anxiety scores, compared with older men (over 50) who had the lowest scores (p<0.001; Table 2). Men who were in a regular relationship had lower HIV anxiety scores compared to men who were not in a regular relationship (p <0.001). Men who reported any R-CLAIC scored higher on HIV anxiety compared to men who reported no R-CLAIC (p=0.033). Neither eligibility for PrEP nor use of PrEP was associated with either generalised anxiety or HIV anxiety.

[Please insert TABLE 2 here]

PrEP-ineligible GBM

We examined differences based on PrEP use separately for PrEP-eligible and PrEP-ineligible subsamples. In a univariate regression, PrEP-ineligible men who used PrEP were older, more likely to be tertiary educated, reported a greater number of sex partners, and were more socially engaged with gay men compared to PrEP-ineligible men not using PrEP. They also scored lower on the measure of generalised anxiety but somewhat higher on HIV anxiety. [Table 3] In multivariable analysis, a greater number of sex partners (aOR = 1.06; 95% CI = 1.05 – 1.07; p<0.001) and being more socially engaged with gay men (aOR = 1.40; 95% CI = 1.27 – 1.55; p<0.001) were independently associated with PrEP use. Among non-eligible men, HIV anxiety was not independently associated with PrEP use.

[Please insert TABLE 3 here]

PrEP-eligible GBM

Among PrEP-eligible men, GBM using PrEP were older, more likely to be tertiary educated, and were more socially engaged with gay men, compared to PrEP-eligible men not using PrEP. [Table 4] They also reported more sex partners and scored lower on measures of both generalised anxiety and HIV anxiety. In multivariable analysis, being tertiary educated (aOR = 2.47; 95% CI = 1.47 – 4.13; p<0.001), more sexual partners (aOR = 1.04; 95% CI = 1.02 – 1.06; p<0.001), greater social engagement with other gay men (aOR = 1.40; 95% CI = 1.19 – 1.65; p<0.001), and scoring lower on HIV anxiety (aOR = 0.92; 95% CI = 0.86 – 0.99; p=0.006) remained independently associated with PrEP use among PrEP-eligible men.

[Please insert TABLE 4 here]

Discussion

We assessed the associations between PrEP use and HIV anxiety in a large cohort of Australian GBM. We found that among PrEP-eligible men, PrEP use was associated with lower levels of HIV anxiety compared to PrEP-eligible men who do not use PrEP. Among PrEP-ineligible men, there were no differences observed in HIV anxiety between men who used PrEP and those that did not. These findings may have significant implications for how PrEP is promoted as a HIV prevention strategy. Reduced HIV anxiety among PrEP-eligible men is a significant peripheral benefit from PrEP use, in addition to protection from HIV infection. Our findings are similar to those reported by studies of GBM in Australia and the USA, which found that HIV concerns and sexual anxiety were lower after GBM had commenced PrEP.[25,26] However, in our study, we compared HIV anxiety according to whether men were taking PrEP both for PrEP-eligible and PrEP-ineligible men.

Among HIV-negative GBM, the anticipation of possible HIV infection has been associated with elevated levels of anxiety,[15] and reduced HIV testing.[9] Among some young GBM, greater symptoms of anxiety are associated with higher rates of receptive and insertive CLAIC.[33] Using PrEP as an HIV prevention strategy may benefit such men.

Before the advent of PrEP for HIV prevention, many HIV-negative and untested men relied on serosorting to limit sex, or CLAI to other men with the same serostatus,[34] and some specifically excluded HIV-positive men when looking for prospective sexual partners.[35] Despite the strong evidence from clinical studies on the effectiveness of maintaining an undetectable HIV viral load in preventing sexual transmission of HIV,[36-38] less than one-fifth of Australian HIV-negative and untested men surveyed in 2017 believed that HIV treatment was effective in preventing HIV transmission.[39] In addition to reducing anxiety among HIV-negative men, increased uptake of PrEP may help to reduce HIV stigma. However as

suggested by Brown and colleagues, realizing the potential of biomedical HIV prevention technologies such as PrEP and treatment as prevention to reduce HIV stigma among communities of GBM is likely to require investment from HIV researchers, policymakers and program implementers in a multifaceted approach.[40]

Among PrEP-ineligible men, those who used PrEP had more partners and were more socially connected to gay men compared to PrEP-ineligible men who did not use PrEP. Although their behaviour did not include practices that would have made them eligible for PrEP, they may have nonetheless had concerns about their level of sexual activity as a potential HIV risk factor, which in some cases may have had some foundation. Using PrEP may have helped to alleviate these concerns but among these PrEP-ineligible men, PrEP use was not associated with reduced HIV anxiety. For some PrEP-ineligible men, their use of PrEP may reflect an underlying anxiety that does not reflect their actual level of risk, and which their use of PrEP has been unable to resolve.

Among PrEP-eligible men, those who used PrEP lower anxiety about HIV was independently associated with PrEP use. Men who were using PrEP were more socially connected to other gay men; this may be related to how PrEP was promoted in Australia. As PrEP uptake in Australia has been greatest among GBM,[2,3] these men may have been more familiar with PrEP due to their greater connection to other gay men. From 2016, PrEP was made available in large demonstration studies that mainly recruited GBM. There was broad promotion of PrEP to GBM by community organisations in gay media and outdoor advertising which was concentrated in geographic areas with gay venues and high proportions of gay male residents.[41] As PrEP use increased among men living in suburbs with high concentrations of gay men and/or with stronger connections to gay community, men who were more socially engaged with other gay men would have been more likely to know men on PrEP. An

Australian study of PrEP use among GBM has found that PrEP users were more likely to know other PrEP users (and HIV-positive men) than men who were not using PrEP.[26]

In previous analyses, we have found that PrEP-eligible men who initiate PrEP more frequently report CLAIC, as well as greater partner numbers than PrEP-eligible men who do not initiate PrEP use.[42] A similar finding here reiterates that men who use PrEP tend to engage in higher levels of CLAIC than those who do not use PrEP, even among men who are eligible for PrEP.[43] Elsewhere, we have also reported that men who initiate PrEP express a desire for CLAI both before and after initiating PrEP, and that this desire remains unchanged by PrEP initiation.[44] Pre-existing desires for sexual practices that are known to be high risk for HIV transmission may be cause for some anxiety, particularly for men who appear to engage in such behaviours despite the risk, even if they do so infrequently or inconsistently. However, PrEP use provides protection from HIV and uncouples such protection from the moment of sex, permitting users to engage in desired practices without the threat of HIV infection present. PrEP-eligible men who used PrEP effectively mitigated their HIV risk and, possibly, their anxiety about HIV was also reduced, but this did not apply to PrEP-eligible men who had not initiated PrEP

While this volunteer, online convenience sample was similar in characteristics and behaviours to those of participants in other samples of Australian GBM, it is unlikely to be representative of all homosexually active men in Australia.[28,31,32,45,46] This sample was mostly comprised of highly attached to gay community, and most participants were Anglo-Celtic, Australian born men. Additionally, participants who were excluded from the analysis were significantly different on some variables to men who were included. The generalizability of our findings to other locations may be limited by differences between Australia and other countries. The self-reported data used in this study is open to recall and social desirability

biases, but we believe deidentified online data collection would have mitigated social desirability bias. While this cross-sectional analysis found that HIV anxiety is lower among PrEP-eligible men who use PrEP, we could not determine causal relationships. In the context of the rapid increase in PrEP uptake in Australia, data from long term follow-up will be beneficial to investigate whether lower HIV anxiety predicts PrEP initiation or is an outcome of taking PrEP. While the PrEP eligibility criteria have been established to identify behaviours that represent high-risk for HIV, they may not capture all people at risk.

As modelling suggests that in order to achieve sustained population-level impact from PrEP uptake to reduce HIV transmissions among GBM, PrEP uptake needs to be rapid.[46] We feel that our findings are timely and important for influencing social marketing or other initiatives increase demand for PrEP that could emphasize the potential for PrEP to reduce anxiety among GBM at high risk of HIV. A strength of this study is that participants were not recruited according to their PrEP status or eligibility for PrEP.

Conclusions

Our findings may have implications for how PrEP is promoted as an HIV prevention strategy for people at risk of infection. Reduced anxiety about HIV transmission among men engaging in CLAIC who were eligible for PrEP prescription represents a significant benefit from PrEP use, in addition to protection from HIV infection.

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TABLES

Table 1: HIV anxiety items – factor analysis. (N=1547)

	Level of endorsement of statement n (%)						*Total Item Mean (SD)*
	Strongly Disagree	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*	
HIV anxiety (α=0.820)							
After having sex I sometimes get concerned that I might have done something risky.	353 (22.8)	283 (18.3)	112 (7.2)	440 (28.4)	272 (17.6)	87 (5.6)	3.17 (1.60)
I sometimes worry about HIV before having sex.	336 (21.7)	290 (18.7)	109 (7.0)	400 (25.9)	338 (21.8)	74 (4.8)	3.22 (1.60)
When I'm having sex HIV tends to come to mind.	469 (30.3)	492 (31.8)	186 (12.0)	235 (15.2)	130 (8.4)	35 (2.3)	2.46 (1.39)

*Items included in the HIV anxiety scale. SD=Standard deviation

Table 2: Characteristics of sample and HIV anxiety measure. (N=1547)

	n (%)	Mean HIV anxiety score (SD)	p-value
Age			0.001
25 years or less	343 (22.2)	9.59 (4.00)	
26-35	495 (32.0)	8.73 (4.08)	
36-50	408 (26.4)	8.73 (3.96)	
Over 50	301 (19.5)	8.35 (3.88)	
Education			0.717
Less than university	562 (36.3)	8.90 (3.95)	
University level	985 (63.7)	8.82 (4.04)	
Sexual identity			0.664
Gay-identified	1402 (90.6)	8.87 (4.05)	
Bisexual-identified	107 (6.9)	8.64 (3.78)	

Other	38 (2.5)	8.39 (3.05)	
Gay friends			0.228
None	35 (2.3)	9.14 (3.99)	
A few	472 (30.5)	8.95 (4.05)	
Some	525 (33.9)	9.00 (3.92)	
Most	500 (32.3)	8.53 (4.04)	
All	15 (1.0)	9.93 (4.54)	
Time spent with gay friends			0.075
Not provided	1 (0.1)	N.A.	
None	139 (9.0)	8.71 (4.28)	
A little	565 (36.5)	9.16 (4.06)	
Some	525 (33.9)	8.79 (3.85)	
A lot	317 (20.5)	8.44 (4.02)	
HIV status			0.061

HIV-negative	1378 (89.1)	8.91 (4.01)	
Untested	169 (10.9)	8.30 (3.92)	
Relationship status			<0.001
Not in relationship	868 (56.1)	9.48 (3.88)	
In a relationship	679 (43.9)	8.04 (4.03)	
Number of partners in previous 6 months			0.056
None	143 (9.2)	8.65 (4.25)	
Less than 10	792 (51.2)	8.65 (4.08)	
10 or more	612 (39.6)	9.15 (3.84)	
Sex with HIV-positive regular partner with detectable viral load in previous 6 months			0.591
No condomless anal intercourse	1546 (99.9)	8.84 (4.01)	
Any condomless anal intercourse	1 (0.01)	11.00 (-)	
Sex with casual partners in previous 6 months			0.033

No receptive condomless anal intercourse	1227 (79.3)	8.74 (4.04)	
Any receptive condomless anal intercourse	320 (20.7)	9.27 (3.86)	
Methamphetamine use			0.061
Not used in previous 6 months	1405 (90.8)	8.91 (4.02)	
Any use in previous 6 months	142 (9.2)	8.25 (3.80)	
Eligibility for PrEP			0.218
Met no eligibility criteria	1141 (73.8)	8.77 (4.05)	
Met any eligibility criteria	406 (26.2)	9.06 (3.88)	
Use of PrEP			0.383
Not using PrEP	972 (62.8)	8.91 (4.09)	
Used PrEP in previous 6 months	575 (37.2)	8.73 (3.86)	

Table 3: Factors associated with PrEP use among men who did not meet PrEP eligibility criteria. (N=1141)

	Not using PrEP n=861 (%)	Using PrEP n=280 (%)	OR (95%CI)	aOR (95%CI)
n (%)				
Age Mean (SD)	35.21 (14.04)	39.18 (12.21)	1.02 (1.01-1.03)	
25 years or less	251 (88.1)	34 (11.9)		
26-35	280 (75.5)	91 (24.5)		
36-50	177 (64.1)	99 (35.9)		
Over 50	153 (73.2)	56 (26.8)		
Education				
Less than university	333 (79.1)	88 (20.9)	1.00	
University level	528 (73.3)	192 (26.7)	1.38 (1.03-1.83)	
Relationship status				
Not in relationship	430 (76.0)	136 (24.0)	1.00	
In a relationship	431 (75.0)	144 (25.0)	0.95 (0.72-1.24)	
Mean (SD)				
HIV anxiety**	8.72 (4.12)	8.93 (3.85)	1.01 (0.98-1.05)	

GSE***	3.26 (1.52)	4.18 (1.50)	1.50 (1.36-1.65)	1.40 (1.27-1.55)
Number of partners in previous 6 months	5.52 (10.28)	23.99 (37.50)	1.07 (1.05-1.08)	1.06 (1.05-1.07)

*Generalised Anxiety Disorder 7 scale score; **HIV anxiety scale score; ***Gay social engagement scale score

Table 4: Factors associated with PrEP use among men who met PrEP eligibility criteria. (N=406)

	Not using PrEP n=111	Using PrEP n=295	OR (95%CI)	aOR (95%CI)
n (%)				
Age Mean (SD)	35.62 (14.11)	41.08 (12.36)	1.04 (1.02-1.05)	
25 years or less	34 (58.6)	24 (41.4)		
26-35	32 (25.8)	92 (74.2)		
36-50	20 (15.2)	112 (84.8)		
Over 50	25 (27.2)	67 (72.8)		
Education				
Less than university	57 (40.4)	84 (59.6)	1.00	1.00
University level	54 (20.4)	211 (79.6)	2.65 (1.69-4.16)	2.47 (1.47-4.13)
Relationship status				
Not in relationship	88 (29.1)	214 (70.9)	1.00	
In a relationship	23 (22.1)	81 (77.9)	0.69 (0.41-1.17)	
Mean (SD)				
HIV anxiety**	10.42 (3.58)	8.54 (3.88)	0.88 (0.83-0.93)	0.92 (0.87-0.99)

GSE***	3.25 (1.74)	4.43 (1.42)	1.61 (1.39-1.87)	1.40 (1.19-1.65)
Number of partners in previous 6 months	13.95 (16.97)	46.50 (68.29)	1.05 (1.03-1.06)	1.04 (1.02-1.06)

*Generalised Anxiety Disorder 7 scale score; **HIV anxiety scale score; *** Gay social engagement scale score