Comparison of the Influence of Internalised Homonegativity on Sexual Risk Behaviour of Men Who Have Sex with Men in Spain and Turkey

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Abstract

In a sample of men who have sex with men (MSM) in Spain (N=3,336) and Turkey (N=550) who are at risk of HIV, we examined how internalised homonegativity (IH) is associated with the number of non-steady male condomless intercourse partners (as a proxy of sexual risk behaviour). We employed multigroup structural equation modelling (MG-SEM) and estimated the relationship between IH and sexual risk behaviour and possible mediating effects of HIV/PrEP knowledge, substance use, and sex under the influence of substances on this relationship. Measurement and structural invariance across countries were established. We found no direct effect of IH on sexual risk behaviour, neither for MSM in Spain nor Turkey. HIV/PrEP knowledge mediated the relationship between IH and sexual risk behaviour among MSM in Spain, but not among men in Turkey. Neither substance use nor sex under the influence of substances mediated the relationship. However, in both samples, IH was negatively associated with HIV/PrEP knowledge and sex under the influence of substances was positively associated with sexual risk behaviour. Higher HIV/PrEP knowledge was associated with higher sexual risk behaviour among MSM in Spain, while among MSM in Turkey the association was in the opposite direction. Our results underscore the differences in country specific needs for HIV prevention programs and that the different mechanisms through which IH operates in Spain and Turkey should be taken into consideration when tailoring these programs.

Introduction

In 2019, sex between men accounted for 38.7% of all new HIV diagnoses in the countries of the European Economic Area (European Centre for Disease Prevention and Control & World Health Organization, 2020). Rates of HIV among men who have sex with men (MSM) are particularly high in Spain and Turkey (Mirandola et al., 2018) (Centro Nacional de Epidemiología, 2018) (T.C. Sağlık Bakanlığı, 2021).

There are many explanations for behaviours that may increase HIV transmission risk among MSM, of which Meyer's minority stress model (Meyer (2003)) is an oft cited explanatory model. The model refers to the "excess stress to which individuals from stigmatized social categories are exposed as a result of their social, often a minority, position." A minority stressor relevant to HIV transmission risk that has been expanded upon in Meyer's (2003) model is Internalised Homonegativity (IH). It is defined as negative feelings about one's homosexuality, as a product of social and political stigma and bias rather than a response which stems from within individuals (Herek, 2004). IH has been found to be associated with reduced mental health and well-being (Newcomb & Mustanski, 2010a), problems with coming out (Costa et al., 2013), and depression and drug use (Moody et al., 2018). Importantly, findings about the associations between IH and well-being, depression, and drug use are factors that are known to be associated with sexual risk behaviours (SRB) and transmission of STIs among MSM. However, inconsistent results point to uncertainties about the extent to which IH influences engagement in SRB (Newcomb & Mustanski, 2010a; Puckett et al., 2017a). While some studies found that higher levels of IH was associated with more frequent SRB (Folch et al., 2009; Newcomb & Mustanski, 2010a; Puckett et al., 2017a), other studies did not find evidence for a direct relationship (Dawson et al., 2019; Dudley et al., 2004; Newcomb & Mustanski, 2010a; Puckett et al., 2017a).

The inconsistent evidence regarding the relationship between IH and SRB can be partly explained with the existence of potential mediator variables (Kashubeck-West & Szymanski, 2008). Researchers explain that in general, transmission risk of STIs among MSM is mediated by multiple social and structural factors that influence their sexual practices (Baral et al., 2013). These factors jeopardise prevention efforts by limiting MSM's options for accessing prevention services for HIV and other STIs (Andrinopoulos et al., 2015; Velter et al., 2015). Specifically, higher levels of IH seem to hinder their connection to the gay community (Goldbach et al., 2015; Moody et al., 2018), thus, they may also miss information about HIV prevention and risk reduction programs (Williamson, 2000). Similarly, higher levels of IH was found to be associated with higher prevalence of drug use (Moody et al., 2018; Puckett et al., 2017a; Sewell et al., 2017). In turn, higher prevalence of drug use consumption was associated with a higher prevalence of condomless anal sex or sex with multiple partners in Spain (Fernández-Dávila & Zaragoza Lorca, 2009; Folch et al., 2006, 2010; González-Baeza et al., 2018) and in other contexts (Choi et al., 2005; Drumright et al., 2006; Kashubeck-West & Szymanski, 2008).

It is also possible that the relationship between IH and SRB differs across different socio-cultural contexts, as sexual minority men's daily experiences and identity development are context specific. A global study of 109,000 gay and bisexual men recently documented that socio-political and cultural homonegativity varies in its manifestation and intensity, and that both manifest socio-political stigma and actual discriminatory events independently contribute to high levels of IH (Berg et al., 2017). For example, while Spain is among the countries with

the least hostility toward sexual minorities and offers social protection laws against sexual identity discrimination, Tukey is among the countries with the greatest hostility, with >90% of the population believing that homosexuality is morally unacceptable (Berg et al 2016). Although Turkey is among the very few countries worldwide that has never criminalised homosexuality, sex between men – particularly taking the receptive role in anal sex – has been a stigmatised behaviour both among MSM and general society, despite being culturally prevalent for centuries. Unsurprisingly, studies show that IH among Turkish MSM was considerably higher than among Spanish MSM (The EMIS Network, 2013, 2019).

Further, as mentioned, in both Spain and Turkey, an important mode of HIV transmission is sex between men (30.6% in Turkey and 38% in Spain) (Erdinc et al., 2020). However, compared to MSM in Spain, MSM in Turkey suffer from a lack of health services that are tailored for them (Doran et al., 2021; Schmidt et al., 2013). The European MSM Internet Survey (EMIS-2017), showed that while 12.6% of MSM reported lacking control of safer sex in Spain, this rate was 16.7% in Turkey (The EMIS Network, 2013, 2019). Similarly, in the same study, MSM in Turkey reported less awareness of PrEP, less certainty about their HIV status, and less social support in general when compared to MSM in Spain. Unfortunately, there are only a handful of empirical studies concerning Turkish MSM. Among the few studies is a cross-sectional study including 562 sexual minority men in Portugal and Turkey. It found that Turkish men reported significantly higher IH and identity stigma compared to Portuguese men. These differences, in turn, were associated with Turkish men's reduced probability of sexual identity disclosure to family and friends (Torres & Rodrigues, 2021).

Given the inconsistent evidence regarding the relationship between IH and SRB, the uncertainty of the influence of moderators, the contextual differences between Spain and Turkey, and the limited research on IH in Turkey, further research on IH is important. Documenting the association between IH and SRB and possible mediator variables of this relationship within both Spain and Turkey will help determine varying needs in prevention efforts. Thus, using a multi-group structural equation modelling (MG-SEM), our study aimed to disentangle the possible influence of drug use and knowledge regarding HIV and PrEP on the relation between IH and SRB in national samples of MSM living in Spain and Turkey.

Sample and Methods
Study Sample
We used data from the 2017 wave of the European MSM Internet Survey (EMIS-2017). The detailed methods have been reported elsewhere (Weatherburn et al., 2020). EMIS-2017 was an internet based, self-completion survey conducted in 33-languages for men living in Europe who have sex with men and/or are sexually attracted to other men. No financial incentives were given to participants and no personal identifying information (including IP addresses) were collected. More background information is available at www.emis2017.eu.

The sub-sample of MSM living in Turkey consisted of 1,855 respondents, with 94.3% using the Turkish language version of the survey, followed by 3.5% using the English version. Recruitment largely occurred through trans-national dating apps. Hornet accounted for 31% of recruits, PlanetRomeo for 25%, and Grindr, SCRUFF, GROWLr, RECON, Gaydar, and Manhunt/Jack'd collectively for 4%. Recruitment was also through national partners via

websites (3%) and social media (3%). For 34% of respondents, the source of recruitment remained unknown.

The sub-sample of MSM living in Spain consisted of 10,652 respondents, including men living in the autonomous provinces of Canarias, Ceuta, Melilla (geographically outside Europe) as well as men living in the Principality of Andorra (but not in the British Overseas Territory of Gibraltar), with 92.1% using the Spanish (Castilian) version of the survey (no other co-official languages of Spain, such as Catalan/Valencian, Galician, or Basque were offered). Recruitment occurred through trans-national dating apps. Grindr accounted for 48%, PlanetRomeo 19%, and SCRUFF, GROWLr, RECON, Gaydar, Hornet, and Manhunt/Jack'd collectively 11% of recruits living in Spain. MSM were also recruited through national partners via websites (16%) and social media (1%) (Ministerio de Sanidad, 2020).

The IH scale questions were randomly distributed to half of the survey respondents, to avoid losing participants because of asking too many questions. We excluded MSM who did not provide answers to all seven items of the scale (Spain n=6,020; Turkey n=1,092), MSM who reported having undetectable viral load (Spain n=613; Turkey n=80), and those using PrEP (Spain n=117; Turkey n=11), because condomless anal intercourse among men with undetectable viral load or using PrEP bear no intrinsic HIV risk. Therefore, our final analytical sample consisted of 3,902 MSM in Spain and 672 MSM in Turkey.

Measurements

Internalised homonegativity. To assess IH, we used the 7-item SIHS (Berg et al., 2013; Tran et al., 2018). EMIS-2017 participants answered the items on a 7-point disagree-agree (with does-not-apply) scale. The SIHS items are "Social situations with gay men make me feel uncomfortable"; "Homosexuality is morally acceptable to me"; "Even if I could change my sexual orientation, I wouldn't"; "I feel comfortable in gay bars"; "I feel comfortable being seen in public with an obviously gay person"; "I feel comfortable being a homosexual man"; "Even if I could change my sexual orientation, I wouldn't". The validity and reliability of SIHS were confirmed across 38 European countries, with multigroup validation for 7-item scale fit indices showing good fit to data from 38 country groups (CFI=0.982, TLI=0.983, and RMSEA=0.032) (see Tran et al. (2018) for further statistics).

Sexual Risk Behaviour (SRB). SRB of the respondents was assessed with a single question: "How many non-steady male partners have you had intercourse without a condom with in the last 12 months?" Participants were informed that non-steady partners means "men you have had sex with once only, and men you have sex with more than once but who you don't think of as a steady partner (including one-night stands, anonymous and casual partners, regular sex buddies)". The possible answer options for this question in the survey ranged from 0 to 15; with numbers 0 to 10 equivalent to their values, and numbers 11 to 15 indicating 11–20, 21–30, 31–40, 41–50, and more than 50 partners respondents had condomless intercourse with. We recoded this variable into seven categories: 0; 1; 2–5; 6–10; 11–20; 20–50; and more than 50. Note that our definition of the risk behaviour is related to HIV risk and does not relate directly to other STIs.

HIV/PrEP Knowledge. We used two measures to construct the HIV/PrEP knowledge latent variable: HIV knowledge and PrEP knowledge. HIV knowledge was constructed from seven items, assessed with a 5-point knowledge response set, with possible answers including

"I do not believe this", "I wasn't sure about this", and "I knew this already". These items were "AIDS is caused by a virus called HIV"; "If someone becomes infected with HIV it may take several weeks before it can be detected in a test"; "You cannot be confident about whether someone has HIV or not from their appearance"; "There is a medical test that can show whether or not you have HIV"; "There is currently no cure for HIV infection"; "HIV infection can be controlled with medicines so that its impact on health is much less"; "A person with HIV who is on effective treatment (called 'undetectable viral load') cannot pass their virus to someone else during sex." PrEP knowledge included three items assessed with the same response set: "Pre-Exposure Prophylaxis (PrEP) involves someone who does not have HIV taking pills before as well as after sex to prevent them getting HIV"; "PrEP can be taken as a single daily pill if someone does not know in advance when they will have sex"; "If someone knows in advance when they will have sex, PrEP needs to be taken as a double dose approximately 24 hours before sex and then at both 24 and 48 hours after the double dose." Each of these 10 items were recoded into a dummy variable, with value 1 indicating "I knew this already," and value 0 indicating all the other answers. Then, we created an additive scale with these 10 items. With each factual knowledge (I knew this already), respondents scored one point on the additive scale, thus the score ranged from 0 to 10.

Substance Use. We used six observed variables for the substance use latent variable, based on how long-ago respondents used substances in any context. The six substances (see table 1) were assessed with an 8-point recency scale, ranging from (1) "never" to (8) "in the past 24 hours" (after inverting the original scale).

Sex Under the Influence of Substances (SUIS). The respondents were asked, "In the last 12 months, how much of the sex you've had with men has been under the influence of alcohol or any other drug?" The possible answers for this question ranged from (1) "none of it" to (7) "all of it".

Methods

We use RStudio and the 'lavaan' package (Rosseel, 2012) to run our structural equation model. Prior to the analysis, the data was checked for multicollinearity, missing data, departures from normality and distributions. Multicollinearity was not present. Missing data were handled with pairwise deletion and after this step, our sample consisted of 3,694 MSM in Spain and 550 MSM in Turkey. For descriptive purposes, we first estimated the prevalence and means (if applicable) of all variables, by country. Comparisons of variables between each category were conducted using Rao-Scott chi-square. We used a multi-group structural equation modelling (MG-SEM) approach. It is useful if the research sample involves more than one sample and the concern is to determine whether or not the components of the estimations are equivalent across groups (Byrne, 2016).

We applied the two-step approach proposed by Byrne (2016), whereby we first established invariance of the measurement model's groups, and then of the structural model (for a similar example, see Sihombing (2012)). First, we established a baseline model for the samples from Spain and Turkey separately. Measurement invariance of a multiple-group confirmatory factor analysis (MG-CFA) is necessary when a construct is to be tested across groups or points in time, and to determine whether the compared groups are based on instruments that measure the same construct (Chen, 2007). Levels of measurement invariance

has implications on the interpretation of differences across groups (Hirschfeld & von Brachel, 2014). Therefore, the goal is to determine and establish the measurement invariance, so that we can have a statistical model in which we can assume that the constructs are interpreted in the same way by the participants across groups (van de Schoot et al., 2012). Briefly, measurement invariance is established by first having a baseline CFA model where the paths are the same across groups, but parameter loadings, intercepts, and residuals are allowed to vary across groups. Then, a series of model comparisons are examined, into which we introduce stricter equality constrains to be able to test the model fit's change. If all the equality constrains and the model fit the data well, then the interpretation of the relationship can be attributed to pure differences across groups. These steps are explained in greater detail elsewhere (Chen, 2007; Hirschfeld & von Brachel, 2014; van de Schoot et al., 2012).

Following the above mentioned steps, we established the model's fit using confirmatory factor analysis (CFA) for each sample separately, to determine how well the models fit the data across groups when no cross-groups constraints are imposed. Next, we introduced equality constraints on particular parameters step-by-step and analysed the data simultaneously. When the multi-group CFA's measurement validity was established, we introduced structural constraints to our multi-group SEM model to determine whether our SEM model's results were attributable to actual differences across groups, instead of differences of coefficients and parameters estimated from covariances derived from different subsets.

We explain these steps in greater detail in the Appendix. At all steps mentioned, we used commonly employed key fit indices, such as (a) the Comparative Fit Index (CFI); (b) the Tucker-Lewis Index (TLI); (c) the root mean square error of approximation (RMSEA), and (d) Standardized root mean squared residual (SRMR) (Hu & Bentler, 1999; Weston & Gore, 2006). Most studies suggest that values higher than .95 for CFI and TLI indicate good fit (Hu & Bentler, 1999; Weston & Gore, 2006), while some suggest that CFI and TLI > .90 indicate a good fit to data (Moonie et al., 2009) as these fits indicates are susceptible to factors such as estimators and complexity (Xia & Yang, 2019). Given the complexity of our MG-SEM, we employ CFI and TLI > .90 as our fit indices criteria. Further, Hu & Bentler (1999) suggested that values of RMSEA and SRMR < .06 are acceptable, and these values are widely accepted (Weston & Gore, 2006).

Results
Descriptive Statistics
Table 1 presents the descriptive results for the variables. The estimated prevalence for all variables differed by country ($P<0.001$, except for SUIS ($P=0.001$) and GHB/L ($P=0.005$)). Out of 3,694 MSM in Spain, 59.7% (n=2,205) reported no non-steady partners that they had condomless sex with, while 0.5% (n=17) reported more than 50 partners in the last twelve months. In Turkey, about half of the 616 MSM reported no non-steady partners that they had condomless sex with, while only two respondents reported having more than 50 partners in the last twelve months. MSM in Turkey had higher IH score overall (2.4 vs. 1.3 in Spain). In the HIV/PrEP additive scale, MSM in Spain had an overall score of 7.14, while MSM in Turkey scored 6.0. Almost half of respondents in both Spain and Turkey (46.2%, n=1,717; 42.7%, n=261, respectively) reported no SUIS in the last twelve months, while a small portion reported all of it (1.5%, n=57; 1.1%, n=7, respectively).

Table 1. Summary Statistics of Variables, by Country

	Spain		Turkey	
	N	Percent (mean – *median*)	N	Percent (mean – *median*)
Variable				
Number of condomless non-steady partners (SRB)	3,694	-	616	-
0	2,205	59.7	307	49.8
1	574	15.5	63	10.2
2–5	688	18.6	152	24.7
6–10	96	2.6	38	6.1
11–20	77	2.0	29	4.7
20–50	37	1.0	25	4.1
50+	17	0.5	2	0.3
SIHS (range: 0–6)		**1.3**		**2.4**
IH1	3,902	**1.6**	672	**2.4**
IH2	3,902	**1.7**	672	**2.0**
IH3	3,902	**1.6**	672	**3.1**
IH4	3,902	**1.7**	672	**3.0**
IH5	3,902	**1.0**	672	**2.2**
IH6	3,902	**0.4**	672	**1.3**
IH7	3,902	**1.3**	672	**2.4**
HPK Score (range: 1–10)	3,838	**7.1**	660	**6.0**
SUIS	3,713	-	611	-
None of it	1,717	46.2	261	42.7
Almost none of it	1,124	30.3	159	26.0
Less than half	373	10.0	93	15.2
About half	179	4.8	40	6.5
More than half	144	3.9	26	4.3
Almost all of it	119	3.2	25	4.1
All of it	57	1.5	7	1.1
Substance Use				
Alcohol	3,897	*In the last 7 days*	672	*Within the last 6 months*
E (pill)	3,870	*Never*	670	*Never*
E (crystal)	3,873	*Never*	669	*Never*
GHB/L	3,874	*Never*	669	*Never*
Speed	3,872	*Never*	669	*Never*
Cocaine	3,871	*Never*	670	*Never*

Notes: Differences between Spain and Turkey for all variables were all significant and P<0.001 (except for SUIS (P=0.001) and GHB/L (P=0.005)). **SRB,** Sexual Risk Behaviour; **SIHS,** Short Internalised Homonegativity Scale. **IHS1...7**: Seven Internalised Homonegativity Scale items **HPK,** HIV/PrEP Knowledge Additive Scale; **SUIS,** Sex Under the Influence of Substances; **GHB/L**, gamma-Hydroxybutyric acid/Butyrolactone.

Confirmatory Factor Analysis

The CFA model for each country showed a good fit to the data separately Spain: CFI = .97; TLI. = .96; RMSEA = 0.03, Turkey: CFI = .95; TLI = .94; RMSEA = 0.04. We established the measurement invariance for the multi-group CFA step-by-step (see Appendix) and also the final CFA model showed a good fit to data (CFI = 0.95, RMSEA=0.04).

Structural Equation Modelling: Model Fit

Before establishing SEM's fit to the data, we introduced constraints on the intercepts and paths of the model and compared the results to the free model (see Appendix). The comparison did not show statistical significance (P=0.30), which allowed us to conclude that the constrained model was equivalent to the free model. The final multi-group SEM model (see Appendix, Table 2, row3) showed good fit to data (CFI=0.97, TLI=0.96, RMSEA=0.039 (90% CI: 0.039-0.042)).

Structural Equation Modelling: Estimations

We provide standardized estimates of coefficients and errors for both groups. The results are presented in Figure 1 and Table 2. The direct path from IH to SRB (dashed line, Figure 1) did not reach statistical significance for either sample.

For both samples of MSM from Spain and Turkey, IH was negatively associated with HIV/PrEP knowledge. Each standard deviation (SD) increase in the IH latent variable was significantly associated with 0.226 and 0.263 decrease in the HIV/PrEP knowledge units, respectively. The relationship between HIV/PrEP knowledge and SRB, however, was different across the two samples of men. For MSM in Spain, each SD increase in the HIV/PrEP knowledge was significantly associated with 0.063 increase in the SRB units. While for MSM in Turkey, each SD increase in the HIV/PrEP knowledge was significantly associated with 0.084 decrease in the SRB units. The effect of IH on HIV/PrEP knowledge was slightly larger in the Turkey sample. Similarly, as shown in Table 2, the indirect relationship between IH and SRB through HIV/PrEP knowledge varied across groups. For MSM in Spain, we found that an increase of 0.226 SD in the IH latent variable was associated with 0.01 decrease SRB units, when mediated by the HIV/PrEP knowledge. In contrast, the indirect relationship between IH and SRB through HIV/PrEP knowledge was statistically non-significant in the Turkey sample.

Figure 1. Estimated Multigroup SEM Results for Spain and Turkey
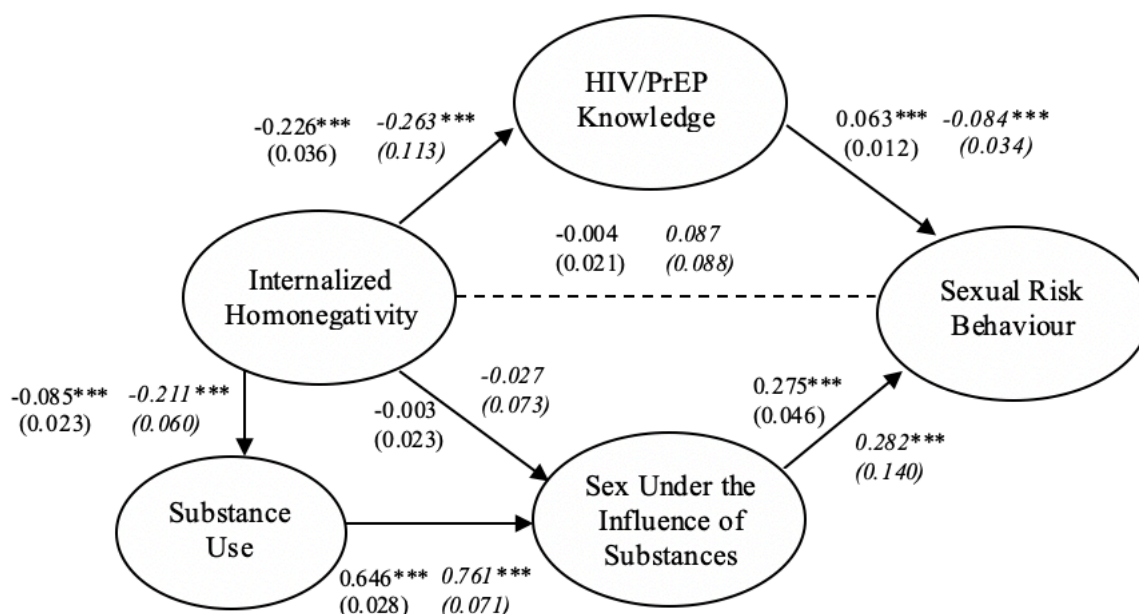
Significance levels: *** p < 0.01, ** p < 0.05, * p < 0.1. **Standardized coefficients** shown for comparability across groups. Coefficients on the left show the results for Spain and coefficients on the right (in italic) show the results for Turkey, and numbers in parenthesis are **robust standard errors**. **Dashed paths** represent the direct relationship to be mediated between Internalised Homonegativity and Sexual Risk Behaviour. Coefficients of observed variables and their standard errors are not shown.

In both samples, with respect to the relationship among IH, SUIS and SRB, we found that the relationship between IH and SUIS was non-significant, while the association between the SUIS latent variable and SRB was positive and significant. Expectedly, Figure 1 shows that a standard deviation increase in SUIS was significantly associated with a 0.275 and 0.282 increase in the SRB units, in the Spain and Turkey samples, respectively. The indirect path between IH and SRB mediated by SUIS was statistically non-significant for both groups (Table 3).

Figure 1 shows that as IH decreased, the recency of substance use and the coefficient were considerably larger in the Turkey sample than in the Spain sample. Each SD increase in the IH latent variable was significantly associated with 0.085 and 0.211 decrease in the substance use units, for the Spain and Turkey samples, respectively. Further, recency of substance use predicted SUIS significantly and positively in both samples. There was also a statistically significant indirect path from IH to SUIS when mediated by substance use recency. As IH increased (0.646 and 0.761 SD), SUIS decreased (0.055 and 0.160 units for the Spain and Turkey samples, respectively); because higher IH predicted less recent use of substances and more recent use of substances predicted higher frequency of SUIS for both groups.

Table 2. Defined Parameters of the Multigroup SEM

Defined Parameters	Standardized Estimates (Std. Errors)		
	Spain	Turkey	Model Fit
(1) IH → HPK → SRB	-0.014*** (0.005)	0.022 (0.019)	$\chi 2 = 740.550$

(2) IH → SUIS → SRB	0.001 (0.008)	-0.008 (0.038)	**DF** = (186) **CFI** = 0.972
(3) IH → SU → SUIS	-0.055*** (0.011)	-0.160*** (0.036)	**TLI** = 0.964 **RMSEA (90% CI)** = 0.039 (0.036-0.042)
(4) Direct Effect (IH → SRB)	-0.004 (0.021)	0.087 (0.088)	**SRMR** = 0.033

*** p < 0.01, ** p < 0.05, * p < 0.1. (1) Relationship between IH and SRB mediated by HIV/PrEP knowledge. (2) Relationship between IH and SRB mediated by frequency of SUIS. (3) Relationship between IH and sex under the influence of substances mediated by substance use. (4) Direct effect of IH on SRB. **IH,** Internalised Homonegativity; **HPK,** HIV/PrEP Knowledge; **SRB,** Sexual Risk Behaviour (*i.e.* number of condomless non-steady sex partners in the previous 12 months), **SU,** substance use, **SUIS,** Sex under the influence of substances. **CFI,** Comparative Fit Index. **TLI,** Tucker-Lewis Index. **RMSEA,** Root Mean Square Error of Approximation. **SRMR,** Standardized Root Mean Square Residual. **DF,** Degrees of Freedom. **CI,** Confidence Interval.

Discussion

In this study, we examined the relationship between IH and SRB, and possible mediators of this relationship across samples of MSM in Spain and Turkey. Among MSM in both countries, we found no direct relationship between IH and SRB, which is consistent with previous research (Dawson et al., 2019; Newcomb & Mustanski, 2010b; Puckett et al., 2017b) and suggestive of there being potential mediators on this relationship (Kashubeck-West & Szymanski, 2008; Newcomb & Mustanski, 2010b). While HIV/PrEP knowledge mediated the relationship between IH and SRB for Spain, we did not find evidence of mediation for Turkey. For both countries, SUIS was not a significant mediator of the relationship between IH and SRB, but substance use significantly mediated the relationship between IH and SUIS.

We found that, for both countries, higher IH was associated with reduced HIV/PrEP knowledge. That is, MSM with higher IH were less likely to be knowledgeable about HIV and PrEP. This finding is consistent with previous studies documenting that IH can reduce awareness of information related to MSM's sexual health. Lower IH has been found to be a predictor of greater sexual identity certainty among gay men (Morandini et al., 2015), and because IH can hinder gay men's connection to and involvement in the gay community (Goldbach et al., 2015; Moody et al., 2018), it may limit their exposure to HIV/PrEP knowledge. Gay communities and venues are where the targeted information is available for gay and bisexual men (Williamson, 2000). It is also worth noting that generational differences can influence gay men's ambivalence of what 'gay community' mean due to the changing status of homosexuality and the HIV epidemic (Holt, 2011). Future studies should consider variables related to community connectedness when examining the relationship between IH and HIV/PrEP knowledge.

An important finding of this study is that while increased HIV/PrEP knowledge was associated with increased number of condomless sexual intercourse with non-steady partners for MSM in Spain, it reduced the number of condomless sexual intercourse with non-steady partners for MSM in Turkey. One explanation for this inconsistent result could be that MSM in Spain, who have much lower IH than MSM in Turkey, are also more likely to be a part of a gay community and therefore have an increased chance of acquiring more knowledge about HIV/AIDS related information and about protecting themselves.

In the sample of MSM in Turkey, HIV/PrEP knowledge did not link IH and SRB. For MSM in Spain, however, we found that as IH increased, the number of condomless intercourse with non-steady partners reported – that is, SRB – decreased; because higher IH was associated with reduced HIV/PrEP knowledge while higher HIV/PrEP knowledge was associated increased SRB. On one hand, this finding may be because men with higher IH tend to have reduced self-efficacy for condom use (Huebner et al., 2002) and those who are less knowledgeable about self-prevention strategies may not be confident enough, given their high IH, to communicate safer sex practices with non-steady partners. On the other hand, it is likely that those men who are able to negotiate safeness that go into sex (i.e. knowing that no HIV transmissions from the HIV-positive partner to the HIV-negative partner would occur if their viral load is undetectable ("U=U; Undetectable=Untransmittable"), communicate about how long ago they have been tested or whether their non-steady partner is using PrEP are more knowledgeable about specific compartments of the HIV/PrEP knowledge scale than those who cannot. For example, the EMIS-2017 study documented that while 63.6% of MSM in Spain were aware of PrEP, this rate was only 29.1% for MSM in Turkey (The EMIS Network, 2019). Similarly, in Spain, 54.5% of MSM had awareness of U=U while this rate was 37.6% in Turkey. Thus, it is possible that MSM in Spain are more likely than MSM in Turkey to protect themselves although they have more condomless sex.

For MSM in both countries, we found that sex under the influence of substances (SUIS) predicted SRB, without IH influencing SUIS. This finding corroborates previous evidence. For example, a study among the attendees of a clinic in Amsterdam reported that among HIV-negative MSM, sex-related drug use was associated with sexually transmitted infections (chlamydia, gonorrhoea, or syphilis) even after adjusting for high-risk sexual behaviour (Heiligenberg et al., 2012). Another study showed that MSM in the UK who reported drug use were more likely to have condomless anal sex with a causal partner in the past year (Sewell et al., 2017). Similarly, we found that substance use recency mediated the relationship between IH and SUIS. As IH increased, SUIS decreased; because higher IH predicted less recent use of substances and more recent use of substances predicted more frequent SUIS. This suggest that higher IH levels can protect MSM from the risk of SUIS and SRB, indirectly. It is possible that this result emerged because MSM with higher IH in our sample perhaps are less likely to be involved in sexual intercourse with non-steady partners in the first place. Alternatively, it is possible these MSM are less likely to attend gay or queer specific venues, where substance use is frequent, as some studies suggest that community attachment for gay men is directly linked with substance use (Carpiano et al., 2011; Moody et al., 2018).

Strengths and Limitations

Our study has several methodological strengths, including being one of the largest datasets of MSM living in Turkey (the 2010 wave of EMIS had slightly more respondents in Turkey) and use of SEM. We used recency time formats (when did you last…) for substance use variables, which reduces the chance of recall bias. Unlike frequency formats, recency format is intuitive for most people. Similarly, there is no recall bias in questions about knowledge and the proportion of sex under the influence of substances. While accurately reporting partner numbers is generally a challenge, we do not believe this affects our

conclusions. Another strength of this study lies in its anonymous character, through which the risk of social desirability bias is reduced (as opposed to the interview setting).

We also acknowledge that the study has limitations. While we used a large, diverse sample of MSM, the data come from a non-probability sample, potentially limiting generalizability, especially to those who are older, have lower education, fewer LGBT community attachments, or are more likely to conceal their sexual orientation (Prah et al., 2016). Yet, our analyses assume that the distribution of variables in the EMIS-2017 sample matches the distribution of these variables in the population. Further, non-probability sampling can also lead to higher estimates of sexual risk, drug use, or knowledge among MSM. These concerns are somewhat attenuated given that the present study was not focused on establishing population estimates or risk behaviours, HIV/PrEP knowledge, or IH, but instead sought to examine associations among variables, for which non-probability sampling is more appropriate (Meyer & Wilson, 2009). Further, probability-based studies typically include relatively small numbers of sexual minorities in one country only, and thus would not have provided an adequate sample size across numerous countries with which to evaluate our research aims.

Conclusion

To our knowledge, this is the first study to examine the impact of internalized homonegativity on sexual risk behaviour of MSM in Turkey. Our SEM results suggest that IH is not directly implicated in the path to SRB. We also found that HIV/PrEP knowledge mediated the relationship between IH and SRB for MSM in Spain, but not MSM in Turkey. Future studies and HIV prevention programs should consider focusing on communicating what actually makes one less vulnerable to HIV, which is the knowledge that goes into the ability to negotiate safe sex, especially in the context of Turkey. Similarly, for MSM in Spain, Future prevention strategies should also target specific counselling for MSM with low IH and who are relatively knowledgeable about HIV risks and how PrEP works, in order to ensure that they are included within the prevention messages. Lastly, in both contexts, it is important that future interventions consider addressing substance use in general and sex under the influence of substances, for this population.

Appendix
Measurement Invariance and Multi-group Confirmatory Factor Analysis

Following Hirschfeld & von Brachel (2014) to test measurement invariance of a MG-CFA, the first step was to run a confirmatory factor analysis (CFA) for each group separately and the validity of CFA for each group is established (Spain: CFI = .97; TLI. = .96; RMSEA = 0.03, Turkey: CFI = .95; TLI = .94; RMSEA = 0.04). Then, we ran a multigroup CFA with no equality constraints, in other words Configural invariance, (Table 1, Model 1 (M1)) and this model also had a good fit (CFI = .97; TLI. = .96; RMSEA = 0.03).

Then, we ran a model where we only constrained the factor loadings to be equal across groups (Table 1, Model 2 (M2)). This is called metric invariance test and it determines whether the respondents of different groups attribute the same meaning to the latent constructs (van de Schoot et al., 2012). When compared to M1, M2 had lower CFI and RMSEA (ΔCFI = 0.004, ΔRMSEA = 0.002), but M2 still had a good fit (CFI = 0.96, RMSEA=0.04). Our CFA model showed metric invariance across groups.

Next, we ran a model where both the factor loadings and intercepts were constrained to be equal across groups (Table 1, Model 3 (M3)). In addition to the meaning of latent constructs, the levels of the underlying manifest variables (intercepts) were held equal in both groups, allowing us to measure scale invariance. When compared to M2, M3 had a lower CFI and RMSEA (ΔCFI = 0.009, ΔRMSEA = 0.004), but M3 still had a good fit (CFI = 0.90, RMSEA=0.04), which gave evidence for our model's scalar invariance.

Finally, we tested the residual invariance of our model, by adding the additional constraint of equal residual variances for the observed variables across the groups (Table 1, Model 4 (M4)). In other words, this final step determines whether the latent construct is measured *identically* across groups (van de Schoot et al., 2012). When compared to M3, M4 had lower CFI and RMSEA, which suggested a poor fit to data. Thus, we rejected M4, as M3 comparatively showed a better fit and residual invariance could not be established.

In the given situation, the next step was to determine partial residual invariance (Hirschfeld & von Brachel, 2014) and identify which individual parameters should be set free so that residual invariance could be established. We step-by-step freed and constrained several individual parameters of M4 based on the modification indices. The results showed that particular observed variables' parameters should be set free in our model. These were: IH5 "*I feel comfortable being a homosexual man;*" IH6 "*Homosexuality is morally acceptable to me;*" IH7 "*Even if I could change my sexual orientation, I wouldn't*" as shown in Table 1, Model 4a (M4a). In other words, we needed to set these observed variables to be estimated differently across the two samples, so that we could establish residual invariance across groups and therefore, attribute the CFA model's results to the differences across groups. M4a showed good fit on its own (CFI = 0.94, RMSEA=0.05) and when compared to the M3 (ΔCFI = 0.017, ΔRMSEA = 0.007). In conclusion, measurement invariance of our MG-CFA is established.

Table 1. Measurement Invariance of Multigroup Confirmatory Factor Analysis

Model	χ2 (df)	CFI	RMSEA (90% CI)	Model Comparison	Δχ2 (Δdf)	ΔCFI	ΔRMSEA	Decision
M1: Configural Invariance	740.55 (186)	0.972	0.039 (0.036-0.042)	-	-	-	-	Accept
M2: Metric Invariance (Loadings)	8,40.21 (197)	0.968	0.040 (0.038-0.043)	M1	11*** (99.66)	0.004	0.002	Accept
M3: Scalar Invariance (Loadings + intercepts)	1,023.14 (208)	0.960	0.044 (0.042-0.047)	M2	11*** (182.94)	0.009	0.004	Accept
M4: Residual Invariance (Loadings + intercepts + residuals)	1,874.94 (221)	0.918	0.061 (0.059-0.064)	M3	9*** (851.80)	0.008	0.003	Reject
M4a: Partial Residual Invariance (Loadings + intercepts + residuals)	1,704.08 (223)	0.943	0.052 (0.049-0.054)	M3	5*** (348.72)	0.017	0.007	Accept

CFI, Comparative Fit Index. **TLI,** Tucker-Lewis Index. **RMSEA,** Root Mean Square Error of Approximation. **SRMR,** Standardized Root Mean Square Residual.

Structural Equation Modelling: Model Fit and Structural Constraints
Model Fit

The fit indices for the SEM models are shown in Table 2. The SEM output for these fit indices suggested that the hypothesized model for Spain (CFI=0.97, TLI=0.96, RMSEA=0.038 (90% CI: 0.035-0.041)), for Turkey (CFI=0.95, TLI=0.94, RMSEA=0.042 (90% CI: 0.033-0.051)), and for the multigroup model (CFI=0.97, TLI=0.96, RMSEA=0.039 (90% CI: 0.039-0.042)) were a good fit to data.

The last step in determining whether our SEM model's results were attributable to actual differences across groups, instead of differences of coefficients and parameters estimated from covariances derived from different subsets. Row 4 in Table 2 shows the comparison results of the free multigroup model versus constrained (paths and intercepts) multigroup model. The result (P-value = 0.30) allowed us to conclude that the constrained model was equivalent to the free model. In other words, the coefficients did not vary by group and comparisons across groups could be interpreted validly within a multigroup model.

Table 2. SEM Fit Indices and Structural Constraints

Model	N	χ2 (df)	CFI	TLI	RMSEA (90% CI)	Δχ2	Δdf	P-Value
(1) Hypothesized Model for Spain	3,336	555.619 (93)	0.975	0.967	0.038 (0.035-0.041)	-	-	-
(2) Hypothesized Model for Turkey	550	184.932 (93)	0.953	0.940	0.042 (0.033-0.051)	-	-	-

(3) Multigroup Hypothesized Model	3,986	740.550 (186)	0.972	0.964	0.039 (0.036-0.042)	-	-	-
(4) Multigroup Free versus Constrained[a]	-	-	-	-	-	1.059	1	0.3034

[a] Model 3 constrained on the paths and intercepts.

CFI, Comparative Fit Index. **TLI,** Tucker-Lewis Index. **RMSEA,** Root Mean Square Error of Approximation. **SRMR,** Standardized Root Mean Square Residual.

References

Andrinopoulos, K., Hembling, J., Guardado, M. E., de Maria Hernández, F., Nieto, A. I., & Melendez, G. (2015). Evidence of the Negative Effect of Sexual Minority Stigma on HIV Testing Among MSM and Transgender Women in San Salvador, El Salvador. *AIDS and Behavior*, *19*(1), 60–71. https://doi.org/10.1007/s10461-014-0813-0

Baral, S., Logie, C. H., Grosso, A., Wirtz, A. L., & Beyrer, C. (2013). Modified social ecological model: A tool to guide the assessment of the risks and risk contexts of HIV epidemics. *BMC Public Health*, *13*(1). https://doi.org/10.1186/1471-2458-13-482

Berg, R. C., Lemke, R., & Ross, M. W. (2017). Sociopolitical and Cultural Correlates of Internalized Homonegativity in Gay and Bisexual Men: Findings from a Global Study. *International Journal of Sexual Health*, *29*(1), 97–111. https://doi.org/10.1080/19317611.2016.1247125

Berg, R. C., Ross, M. W., Weatherburn, P., & Schmidt, A. J. (2013). Structural and environmental factors are associated with internalised homonegativity in men who have sex with men: Findings from the European MSM Internet Survey (EMIS) in 38 countries. *Social Science & Medicine*, *78*, 61–69. https://doi.org/10.1016/j.socscimed.2012.11.033

Byrne, B. M. (2016). *Structural equation modeling with AMOS: basic concepts, applications, and programming* (Third Edition (3rd ed.)). Routledge.

Carpiano, R. M., Kelly, B. C., Easterbrook, A., & Parsons, J. T. (2011). Community and Drug Use among Gay Men: The Role of Neighborhoods and Networks. *Journal of Health and Social Behavior*, *52*(1), 74–90. https://doi.org/10.1177/0022146510395026

Centro Nacional de Epidemiología. (2018). *Plan Nacional sobre el Sida, 2017* (Vigilancia Epidemiológica Del VIH y Sida En España. Sistema de Información Sobre Nuevos Diagnósticos de VIH y Registro Nacional de Casos de Sida). https://www.mscbs.gob.es/ciudadanos/enfLesiones/enfTransmisibles/sida/vigilancia /doc/InformeVIH_SIDA_2018_21112018.pdf

Chen, F. F. (2007). Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *14*(3), 464–504. https://doi.org/10.1080/10705510701301834

Choi, K., Operario, D., Gregorich, S. E., McFarland, W., MacKellar, D., & Valleroy, L. (2005). Substance Use, Substance Choice, and Unprotected Anal Intercourse among Young Asian American and Pacific Islander Men Who Have Sex with Men. *AIDS Education and Prevention*, *17*(5), 418–429. https://doi.org/10.1521/aeap.2005.17.5.418

Costa, P. A., Pereira, H., & Leal, I. (2013). Internalized Homonegativity, Disclosure, and Acceptance of Sexual Orientation in a Sample of Portuguese Gay and Bisexual Men, and Lesbian and Bisexual Women. *Journal of Bisexuality*, *13*(2), 229–244. https://doi.org/10.1080/15299716.2013.782481

Dawson, E. L., Mendoza, M. C. B., Gaul, Z., Jeffries IV, W. L., Sutton, M. Y., & Wilson, P. A. (2019). Resilience, condom use self-efficacy, internalized homophobia, and

condomless anal sex among black men who have sex with men, New York City. *PLOS ONE*, *14*(4), e0215455. https://doi.org/10.1371/journal.pone.0215455

Doran, J., Weatherburn, P., Hickson, F., Marcus, U., Reid, D., & Schmidt, A. J. (2021). An update on the performance of STI services for gay and bisexual men across European cities: Results from the 2017 European MSM Internet Survey. *Sexually Transmitted Infections*, *97*(3), 201–208. https://doi.org/10.1136/sextrans-2020-054681

Drumright, L. N., Little, S. J., Strathdee, S. A., Slymen, D. J., Araneta, M. R. G., Malcarne, V. L., Daar, E. S., & Gorbach, P. M. (2006). Unprotected Anal Intercourse and Substance Use Among Men Who Have Sex with Men With Recent HIV Infection: *JAIDS Journal of Acquired Immune Deficiency Syndromes*, *43*(3), 344–350. https://doi.org/10.1097/01.qai.0000230530.02212.86

Dudley, M. G., Rostosky, S. S., Korfhage, B. A., & Zimmerman, R. S. (2004). Correlates of High-Risk Sexual Behavior among Young Men Who Have Sex with Men. *AIDS Education and Prevention*, *16*(4), 328–340. https://doi.org/10.1521/aeap.16.4.328.40397

Erdinc, F. S., Dokuzoguz, B., Unal, S., Komur, S., Inkaya, A. C., Inan, D., Karaoglan, I., Deveci, A., Celen, M. K., Kose, S., Erben, N., Senturk, G. C., Heper, Y., Kutlu, S. S., Hatipoglu, C. A., Sumer, S., Kandemir, B., Sirmatel, F., Bayindir, Y., … Multicentric HIV Study Group. (2020). Temporal Trends in the Epidemiology of HIV in Turkey. *Current HIV Research*, *18*(4), 258–266. https://doi.org/10.2174/1570162X18666200427223823

European Centre for Disease Prevention and Control & World Health Organization. (2020). *HIV/AIDS surveillance in Europe 2020: 2019 data*. Publications Office. https://data.europa.eu/doi/10.2900/073965

Fernández-Dávila, P., & Zaragoza Lorca, K. (2009). Internet y riesgo sexual en hombres que tienen sexo con hombres. *Gaceta Sanitaria*, *23*(5), 380–387. https://doi.org/10.1016/j.gaceta.2008.11.004

Fingerhut, A. W., Peplau, L. A., & Gable, S. L. (2010). Identity, minority stress and psychological well-being among gay men and lesbians. *Psychology and Sexuality*, *1*(2), 101–114. https://doi.org/10.1080/19419899.2010.484592

Folch, C., Esteve, A., Zaragoza, K., Munoz, R., & Casabona, J. (2010). Correlates of intensive alcohol and drug use in men who have sex with men in Catalonia, Spain. *The European Journal of Public Health*, *20*(2), 139–145. https://doi.org/10.1093/eurpub/ckp091

Folch, C., Marks, G., Esteve, A., Zaragoza, K., Muñoz, R., & Casabona, J. (2006). Factors Associated with Unprotected Sexual Intercourse with Steady Male, Casual Male, and Female Partners Among Men Who Have Sex with Men in Barcelona, Spain. *AIDS Education and Prevention*, *18*(3), 227–242. https://doi.org/10.1521/aeap.2006.18.3.227

Folch, C., Muñoz, R., Zaragoza, K., & Casabona, J. (2009). Sexual risk behaviour and its determinants among men who have sex with men in Catalonia, Spain. *Eurosurveillance*, *14*(47). https://doi.org/10.2807/ese.14.47.19415-en

Goldbach, J. T., Schrager, S. M., Dunlap, S. L., & Holloway, I. W. (2015). The Application of Minority Stress Theory to Marijuana Use Among Sexual Minority Adolescents. *Substance Use & Misuse*, *50*(3), 366–375. https://doi.org/10.3109/10826084.2014.980958

González-Baeza, A., Dolengevich-Segal, H., Pérez-Valero, I., Cabello, A., Téllez, M. J., Sanz, J., Pérez-Latorre, L., Bernardino, J. I., Troya, J., De La Fuente, S., Bisbal, O., Santos, I., Arponen, S., Hontañon, V., Casado, J. L., Ryan, P., & the U-SEX GESIDA 9416 Study. (2018). Sexualized Drug Use (Chemsex) Is Associated with High-Risk Sexual Behaviors and Sexually Transmitted Infections in HIV-Positive Men Who Have Sex with Men: Data from the U-SEX GESIDA 9416 Study. *AIDS Patient Care and STDs*, *32*(3), 112–118. https://doi.org/10.1089/apc.2017.0263

Heiligenberg, M., Wermeling, P. R., van Rooijen, M. S., Urbanus, A. T., Speksnijder, A. G. C. L., Heijman, T., Prins, M., Coutinho, R. A., & van der Loeff, M. F. S. (2012). Recreational Drug Use During Sex and Sexually Transmitted Infections Among Clients of a City Sexually Transmitted Infections Clinic in Amsterdam, The Netherlands. *Sexually Transmitted Diseases*, *39*(7), 518–527. https://doi.org/10.1097/OLQ.0b013e3182515601

Herek, G. M. (2004). Beyond "Homophobia": Thinking about sexual prejudice and stigma in the twenty-first century. *Sexuality Research and Social Policy*, *1*(2), 6–24. https://doi.org/10.1525/srsp.2004.1.2.6

Hirschfeld, G., & von Brachel, R. (2014). Multiple-Group confirmatory factor analysis in R – A tutorial in measurement invariance with continuous and ordinal indicators. *Practical Assessment, Research & Evaluation*, *19*(7), 1–13.

Holt, M. (2011). Gay men and ambivalence about 'gay community': From gay community attachment to personal communities. *Culture, Health & Sexuality*, *13*(8), 857–871. https://doi.org/10.1080/13691058.2011.581390

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Huebner, D. M., Davis, M. C., Nemeroff, C. J., & Aiken, L. S. (2002). The Impact of Internalized Homophobia on HIV Preventive Interventions. *American Journal of Community Psychology*, *30*(3), 327–348. https://doi.org/10.1023/A:1015325303002

Kashubeck-West, S., & Szymanski, D. M. (2008). Risky Sexual Behavior in Gay and Bisexual Men: Internalized Heterosexism, Sensation Seeking, and Substance Use. *The Counseling Psychologist*, *36*(4), 595–614. https://doi.org/10.1177/0011000007309633

Meyer, I. H. (2003). Prejudice, Social Stress, and Mental Health in Lesbian, Gay, and Bisexual Populations: Conceptual Issues and Research Evidence. *Psychol Bull*, *129*(5), 674–697.

Meyer, I. H., & Wilson, P. A. (2009). Sampling lesbian, gay, and bisexual populations. *Journal of Counseling Psychology*, *56*(1), 23–31. https://doi.org/10.1037/a0014587

Mirandola, M., Gios, L., Sherriff, N., Marcus, U., Toskin, I., Rosinska, M., Schink, S., Kühlmann-Berenzon, S., Suligoi, B., Folch, C., Nöstlinger, C., Dias, S., Stanekova, D., Klavs, I., Caplinskas, S., Rafila, A., Marin, C., Alexiev, I., Zohrabyan, L., … on behalf of the SIALON II Network. (2018). Quantifying unmet prevention needs among MSM in Europe through a multi-site bio-behavioural survey. *Eurosurveillance*, *23*(49). https://doi.org/10.2807/1560-7917.ES.2018.23.49.1800097

Moody, R. L., Starks, T. J., Grov, C., & Parsons, J. T. (2018). Internalized Homophobia and Drug Use in a National Cohort of Gay and Bisexual Men: Examining Depression, Sexual Anxiety, and Gay Community Attachment as Mediating Factors. *Archives of Sexual Behavior*, *47*(4), 1133–1144. https://doi.org/10.1007/s10508-017-1009-2

Moonie, S., Huang, X., & Sterling, D. A. (2009). *Quality of Life Estimation with Structural Equation Modeling in School Aged Children with Asthma*. *3*, 1–16.

Morandini, J. S., Blaszczynski, A., Ross, M. W., Costa, D. S. J., & Dar-Nimrod, I. (2015). Essentialist beliefs, sexual identity uncertainty, internalized homonegativity and psychological wellbeing in gay men. *Journal of Counseling Psychology*, *62*(3), 413–424. https://doi.org/10.1037/cou0000072

Newcomb, M. E., & Mustanski, B. (2010a). Internalized homophobia and internalizing mental health problems: A meta-analytic review. *Clinical Psychology Review*, *30*(8), 1019–1029. https://doi.org/10.1016/j.cpr.2010.07.003

Newcomb, M. E., & Mustanski, B. (2010b). The Importance of Measuring Internalized Homophobia/Homonegativity: Reply to Ross, Rosser, and Smolenski (2010a). *Archives of Sexual Behavior*, *39*(6), 1209–1211. https://doi.org/10.1007/s10508-010-9655-7

Prah, P., Hickson, F., Bonell, C., McDaid, L. M., Johnson, A. M., Wayal, S., Clifton, S., Sonnenberg, P., Nardone, A., Erens, B., Copas, A. J., Riddell, J., Weatherburn, P., & Mercer, C. H. (2016). Men who have sex with men in Great Britain: Comparing methods and estimates from probability and convenience sample surveys. *Sexually Transmitted Infections*, *92*(6), 455–463. https://doi.org/10.1136/sextrans-2015-052389

Puckett, J. A., Newcomb, M. E., Garofalo, R., & Mustanski, B. (2017a). Examining the Conditions Under Which Internalized Homophobia Is Associated with Substance Use and Condomless Sex in Young MSM: The Moderating Role of Impulsivity. *Annals of Behavioral Medicine*, *51*(4), 567–577. https://doi.org/10.1007/s12160-017-9878-0

Puckett, J. A., Newcomb, M. E., Garofalo, R., & Mustanski, B. (2017b). Examining the Conditions Under Which Internalized Homophobia Is Associated with Substance Use and Condomless Sex in Young MSM: The Moderating Role of Impulsivity. *Annals of Behavioral Medicine*, *51*(4), 567–577. https://doi.org/10.1007/s12160-017-9878-0

Schmidt, A. J., Hickson, F., Weatherburn, P., Marcus, U., & The EMIS Network. (2013). Comparison of the performance of STI Screening Services for gay and bisexual men across 40 European cities: Results from the European MSM Internet Survey. *Sexually

Transmitted Infections, *89*(7), 575–582. https://doi.org/10.1136/sextrans-2012-050973

Sewell, J., Miltz, A., Lampe, F. C., Cambiano, V., Speakman, A., Phillips, A. N., Stuart, D., Gilson, R., Asboe, D., Nwokolo, N., Clarke, A., Collins, S., Hart, G., Elford, J., & Rodger, A. J. (2017). Poly drug use, chemsex drug use, and associations with sexual risk behaviour in HIV-negative men who have sex with men attending sexual health clinics. *International Journal of Drug Policy*, *43*, 33–43. https://doi.org/10.1016/j.drugpo.2017.01.001

Sihombing, S. O. (2012). Comparing Entrepreneurship Intention: A Multigroup Structural Equation Modeling Approach. *International Research Journal of Business Studies*, *5*(1), 57–71. https://doi.org/10.21632/irjbs.5.1.57-71

T.C. Sağlık Bakanlığı. (2021). *HIV-AIDS İstatistik*. https://hsgm.saglik.gov.tr/tr/bulasici-hastaliklar/hiv-aids/hiv-aids-liste/hiv-aids-istatislik.html

The EMIS Network. (2013). *EMIS 2010-The European Men-Who-Have-Sex-With-Men Internet Survey: Findings from 38 countries.* European Centre for Disease Prevention and Control. https://data.europa.eu/doi/10.2900/79639

The EMIS Network. (2019). *EMIS-2017: European Men-Who-Have-Sex-With-Men Internet Survey: Key findings from 50 countries.* European Centre for Disease Prevention and Control. https://data.europa.eu/doi/10.2900/690387

Torres, C. A., & Rodrigues, D. L. (2021). Heteronormative Beliefs and Internalized Homonegativity in the Coming Out Process of Portuguese and Turkish Sexual Minority Men. *Sexuality Research and Social Policy*. https://doi.org/10.1007/s13178-021-00582-x

Tran, H., Ross, M. W., Diamond, P. M., Berg, R. C., Weatherburn, P., & Schmidt, A. J. (2018). Structural Validation and Multiple Group Assessment of the Short Internalized Homonegativity Scale in Homosexual and Bisexual Men in 38 European Countries: Results from the European MSM Internet Survey. *The Journal of Sex Research*, *55*(4–5), 617–629. https://doi.org/10.1080/00224499.2017.1380158

van de Schoot, R., Lugtig, P., & Hox, J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology*, *9*(4), 486–492. https://doi.org/10.1080/17405629.2012.686740

Velter, A., Saboni, L., Sommen, C., Bernillon, P., Bajos, N., & Semaille, C. (2015). Sexual and prevention practices in men who have sex with men in the era of combination HIV prevention: Results from the Presse Gays et Lesbiennes survey, France, 2011. *Eurosurveillance*, *20*(14). https://doi.org/10.2807/1560-7917.ES2015.20.14.21090

Weatherburn, P., Hickson, F., Reid, D. S., Marcus, U., & Schmidt, A. J. (2020). European Men-Who-Have-Sex-With-Men Internet Survey (EMIS-2017): Design and Methods. *Sexuality Research and Social Policy*, *17*(4), 543–557. https://doi.org/10.1007/s13178-019-00413-0

Weston, R., & Gore, P. A. (2006). A Brief Guide to Structural Equation Modeling. *The Counseling Psychologist*, *34*(5), 719–751. https://doi.org/10.1177/0011000006286345

Williamson, I. R. (2000). Internalized homophobia and health issues affecting lesbians and gay men. *Health Education Research*, *15*(1), 97–107. https://doi.org/10.1093/her/15.1.97

Xia, Y., & Yang, Y. (2019). RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: The story they tell depends on the estimation methods. *Behavior Research Methods*, *51*(1), 409–428. https://doi.org/10.3758/s13428-018-1055-2