Published in final edited form as:

AIDS Care. 2020 March ; 32(3): 337–342. doi:10.1080/09540121.2019.1678722.

A Syndemic of Psychosocial Health problems is associated with increased HIV sexual risk among Nigerian gay men who have sex with men (GBMSM).

Adedotun Ogunbajo^{1,2}, Temitope Oke³, Harry Jin⁴, William Rashidi⁵, Stella Iwuagwu⁶, Gary W. Harper⁷, Katie B. Biello^{1,2,4,8}, Matthew J. Mimiaga^{1,2,4,8}

¹Brown University School of Public Health, Department of Behavioral and Social Sciences, Providence, RI, United States of America

²Center for Health Equity Research, Brown School of Public Health, Providence, RI, United States of America

³University at Buffalo, State University of New York, School of Social Work, Buffalo, United States of America

⁴Brown University School of Public Health, Department of Epidemiology, Providence, RI, United States of America

⁵Equality Triangle for Health and Peoples Development Initiative, Warri, Delta, Nigeria

⁶Centre for Right to Health, Abuja, Nigeria

⁷University of Michigan School of Public Health, Department of Health Behavior & Health Education, Ann Arbor, MI, United States of America

⁸The Fenway Institute, Fenway Health, Boston, MA, United States of America

Abstract

Nigerian gay, bisexual, and other men who have sex with men (GBMSM) experience negative psychosocial health problems, which may increase their risk for HIV infection. Few studies have explored the syndemic effect of co-occurring psychosocial health problems on HIV sexual risk among Nigerian GBMSM. We investigated the co-occurrence of syndemic psychosocial health problems and their synergistic effect on HIV risk behaviors. We assessed depressive symptoms, post-traumatic stress disorder, alcohol dependence, tobacco use, and hard-drug use. The outcome variables were number of male sexual partners and consistent condom use. In a multivariable model, experiencing 4 or more psychosocial health problems—compared to experience none or one psychosocial health problem—was significantly associated with increasing number of male sexual partners. We found no statistically significant association between the number of syndemic psychosocial health problems and consistent condom use. Our study findings provides evidence of a synergistic relationship between negative psychosocial health factors and HIV sexual risk

Corresponding Author: Adedotun Ogunbajo, MPH, MHS, Brown University School of Public Health, 121 South Main St., Box G-S121-3, Providence, RI 02912, (240) 565-7855, adedotun_ogunbajo@brown.edu.

Disclosure Statement

No conflict of interests to disclose.

behavior. These findings underscore the importance of developing HIV prevention programming aimed at reducing HIV transmission risk that incorporate substance use and mental health treatments, in order to improve the overall health and quality of life for Nigerian GBMSM.

Keywords

Nigeria; GBMSM; Syndemics; Psychosocial Health Problems; HIV Sexual Risk

Introduction

Gay, bisexual, and other men who have sex with men (GBMSM) bear a heavy burden of HIV globally (Beyrer et al., 2012). In Nigeria, GBMSM have an estimated HIV prevalence ranging from 11%–35% compared to 3.6% in the general population (Vu et al., 2013). Additionally, Nigerian GBMSM experience psychosocial health problems, related to the criminalization of same-sex identity in Nigeria and being relentlessly confronted with social stigma, homophobia, discrimination, and victimization (Adebajo, Eluwa, Allman, Myers, & Ahonsi, 2012; Rodriguez-Hart et al., 2018). Nigerian GBMSM report avoidance of healthcare settings, absence of safe spaces to socialize, and encounter blackmail, and verbal harassment, all of which can impact utilization of HIV prevention, testing, and care services contributing to increased vulnerability to HIV infection (Schwartz et al., 2015). These structural and contextual factors may exacerbate psychosocial health problems and remain largely understudied.

Syndemic framework posits that the co-occurrence of multiple negative health conditions can interact synergistically and contribute to excess burden of disease (Ferlatte, Hottes, Trussler, & Marchand, 2014). Research shows that psychosocial health problems (such as mental illness and substance use) are significantly associated with HIV risk and seropositivity among GBMSM (Mimiaga et al., 2015; Mustanski, Garofalo, Herrick, & Donenberg, 2007; Stall et al., 2003). A study conducted among GBMSM in the U.S. found that higher number of psychosocial health problems was associated with higher HIV sexual risk behavior (Stall et al., 2003). A large prospective study of HIV-uninfected GBMSM in the U.S. found a statistically significant positive relationship between the number of syndemic conditions and HIV seroconversion (Mimiaga et al., 2015). There is growing evidence that syndemics framework is a valuable approach to elucidating the relationship between co-occurring psychosocial health problem and HIV risk among GBMSM (Douglas-Vail, 2016; Dyer et al., 2012).

To date, no known published study has explored the syndemic effect of co-occurring psychosocial health problems on HIV risk among Nigerian GBMSM. The purpose of this study is to assess the effect of psychosocial health problems on increasing HIV risk among Nigerian GBMSM. We hypothesize that an increasing number of psychosocial health problems will be associated with increased HIV risk.

Methods

Study Population

We analyzed data from a cross-sectional quantitative study conducted among GBMSM in Lagos, Nigeria between June and August 2017. Participants (N=50) were recruited through referrals from two community-based organizations and peer referrals. Data were collected on sociodemographics, psychosocial health problems, and HIV risk. Eligibility criteria included: (1) assigned male sex at birth, (2) ages 18 years or older, (3) English-speaking and (4) a history of any sex with another birth-assigned male.

Procedures

Verbal consent was obtained from all participants to maintain confidentiality and privacy. Enrolled participants completed an interviewer-administered questionnaire. To ensure confidentiality, participants were assigned a unique study identification number. Participants were compensated with the Naira equivalence of ten U.S. dollars (\$10). All study procedures were approved by the Institutional Review Boards at Brown University and the Nigerian Institute of Medical Research

Measures

Demographics—Participants reported their age, sexual orientation (gay/homosexual, bisexual, straight/heterosexual, or questioning), education attainment (less than university or some university or higher), relationship status (single, married to a woman, married to a man, long-term relationship with a woman, long-term relationship with a man, divorced, widowed, or separated), employment status (employed or unemployed), religious affiliation (Christian, Muslim/Moslem, or African Traditional Religion), and sexual position (top, bottom or versatile).

Sexual Risk Variables—The number of male sexual partners in the past 30 days was assessed with: “In the last 30 days, how many male sexual partners have you had?” Consistent condom use was assessed with, “How often do you use condoms when you have sex with a male?” (always, very often, sometimes, rarely, or never). Responses were dichotomized (always/not always)

Syndemic Psychosocial Variables—*Depressive Symptoms* were assessed using the 10-item Center for Epidemiologic Studies Depression Scale (CES-D)(Andresen, Malmgren, Carter, & Patrick, 1994), a validated survey of clinically significant distress as a marker for clinical depression. The 10-items were scored on a 4-point Likert scale from 0 to 3, with a score of 10 or greater indicating possible clinical depression. Responses were dichotomized (9 or lower/10 or greater). *Post-Traumatic Stress Disorder (PTSD)* was assessed using a 4-item Primary Care PTSD Screen (PC-PTSD)(Cameron & Gusman, 2003), a validated instrument used to screen for PTSD. The scale had answers of ‘yes/no’ and answering ‘yes’ to any three items was considered a possible case of PTSD. *Alcohol Dependence* was assessed using the 10-item Alcohol Use Disorders Identification Test (AUDIT-C)(Saunders, Aasland, Babor, De la Fuente, & Grant, 1993) validated scale that assesses hazardous alcohol use. A score of 8 or greater indicates alcohol dependence. Responses were

dichotomized (7 or lower/8 or higher). *Tobacco Use* was assessed through, “Have you ever used tobacco (cigarettes)?” (yes/no). *Hard Drug Use* was assessed through, “Have you ever used narcotics (opium, morphine, codeine), heroin, cocaine, amphetamine, sedatives/depressants, hallucinogens, designer drugs, or tranquilizers?” (yes/no).

The syndemic variable is a count score based on the sum of psychosocial health problems identified by respondent, resulting in a total score range of 0 to 5.

Data Analysis

Descriptive statistics were calculated for sociodemographic and psychosocial variables (Table 1). To investigate the association of these psychosocial health problems, we conducted bivariate logistic regression for all five psychosocial health problems (Table 2). To assess whether there was a relationship between the syndemic variable and engaging in HIV sexual risk, we constructed two multivariable models. To assess the relationship between the number of psychosocial health problems and number of male sexual partners in the last month, we constructed a multivariable linear regression model—adjusted for age, HIV status, and education attainment—with syndemic psychosocial health problems as the independent variable and the number of male sexual partners in the last month as the dependent variable (Table 3). To assess the relationship between psychosocial health problems and consistent condom use, we constructed a multivariable logistic regression model—adjusted for age, HIV status, and education attainment—with syndemic psychosocial problems as the independent variable and consistent condom use as the dependent variable (Table 3). Data were analyzed using SAS 9.2 (SAS Institute, Cary, NC).

Results

In unadjusted and adjusted linear regression models, the number of psychosocial health problems was significantly associated with the number of male sexual partners in the past 30 days. In the unadjusted model, experiencing four or more psychosocial health problems (compared to zero or one) was significantly associated with increasing number of male sexual partners ($\beta=2.22$, $p<0.05$). After adjusting for age, HIV status, and education attainment, experiencing four or more psychosocial health problems (compared to zero or one) remained significantly associated with increasing number of male sexual partners ($\beta=2.18$, $p<0.05$). In unadjusted and adjusted logistic regression models, the number of psychosocial health problems was not significantly associated with consistent condom use with male sexual partners (OR=0.25, 95% CI (0.04–1.60); AOR=0.24, 95% CI (0.04–1.61)).

Discussion

In this sample of Nigerian GBMSM, we found a significant association relationship between the number of syndemic psychosocial problems and HIV risk. While PTSD and alcohol dependence and alcohol dependence and hard drug use were shown to be significantly associated with each other, we observed a significant effect of the psychosocial health problems on the reported number of male sexual partners in the last month. These findings are consistent with other studies that found a significant association between syndemic

psychosocial health problems and HIV sexual risk among GBMSM (Dyer et al., 2012; Mustanski et al., 2007; Parsons, Grov, & Golub, 2012; Stall et al., 2003).

We found that only 2% had no indication for psychosocial health problems. Furthermore, participants with a lifetime history of PTSD had five times the odds of reporting alcohol dependency in the last 3 months. This finding aligns with other studies that found significant relationships between PTSD and alcohol use disorder among sexual minority men (Banerjee et al., 2018; Marshall et al., 2015; Reisner, Mimiaga, Safren, & Mayer, 2009). It is important that substance abuse treatment programming for Nigerian GBMSM explore traumatic events such as childhood sexual abuse, rape, intimate partner violence, which may contribute to current experiences of PTSD. We found that alcohol dependency in the last 3 months and lifetime hard drug use were significantly associated. Previous research has shown a strong association between unhealthy alcohol use and hard drug use among GBMSM (Daskalopoulou et al., 2014; Korhonen et al., 2018; Ogbuagu et al., 2018). The high prevalence of alcohol dependence and hard drug use and co-occurrence of both is evidence for the need for tailored interventions to address substance use among Nigerian GBMSM.

We found that having a higher number of syndemic psychosocial health problems was significantly associated with a greater number of male sexual partners. This finding has major implications for HIV prevention programming among Nigerian GBMSM. It is critical that HIV prevention programs for Nigerian GBMSM provide information about substance abuse and mental health resources. Additionally, integrated interventions aimed at reducing substance use behavior, improving mental health status and decreasing HIV sexual risk among GBMSM have been shown to be highly effective (Lauby et al., 2017; Reback, Fletcher, Swendeman, & Metzner, 2018). Consequently, engagement in these auxiliary services might improve mental health and substance use behavior and reduce HIV risk.

To our knowledge, this study is the first to explore syndemic psychosocial health problems and HIV sexual risk among Nigerian GBMSM. There are several limitations to this study. Our study was cross-sectional therefore inhibiting any conclusions about causation. Additionally, all measures utilized were self-reported, which may have led to social desirability bias and underestimation of observed effects. The small sample size (N=50) of this pilot study may have resulted in low statistical power, thereby reducing the likelihood of detecting true statistical significance. We utilized community-based organizations to recruit participants for this study. This may have resulted in a biased sample that isn't representative of the GBMSM community in Lagos. Lastly, we are aware of the critique of the "count variable" approach to exploring syndemics of psychosocial problems and HIV risk (Tsai & Burns, 2015) but due to the small sample size we were unable to carry out higher-level modeling to explore syndemic effects.

Despite these limitations, we found that syndemic psychosocial health problems had a positive relationship with number of male sexual partners. These findings underscore the importance of developing HIV prevention programming aimed at reducing HIV transmission risk that incorporate addiction and mental health treatments, to improve the overall health and quality of life for Nigerian GBMSM.

Acknowledgments

We will like to thank all the participants of the study as this study and manuscript will not be possible without their participation. We will also like to thank our in-country collaborators, Centre for Right to Health and Equality Triangle Initiative.

Funding

This study was supported by a grant from Brown University Global Health Initiative. The first author is also supported by grants from the National Institute on Drug Abuse and the Robert Wood Johnson Health Policy Research Scholars Program.

References

- Adebajo SB, Eluwa GI, Allman D, Myers T, & Ahonsi BA (2012). Prevalence of internalized homophobia and HIV associated risks among men who have sex with men in Nigeria. *African journal of reproductive health*, 16(4), 21–28 [PubMed: 23444540]
- Andresen EM, Malmgren JA, Carter WB, & Patrick DL (1994). Screening for depression in well older adults: Evaluation of a short form of the CES-D. *American journal of preventive medicine*, 10(2), 77–84 [PubMed: 8037935]
- Banerjee N, Ironson G, Fitch C, Boroughs MS, Safren SA, Powell A, & O’Cleirigh C (2018). The Indirect Effect of Posttraumatic Stress Disorder Symptoms on Current Alcohol Use Through Negative Cognitions in Sexual Minority Men. *Journal of traumatic stress*, 31(4), 602–612 [PubMed: 30028033]
- Beyrer C, Baral SD, Van Griensven F, Goodreau SM, Chariyalertsak S, Wirtz AL, & Brookmeyer R (2012). Global epidemiology of HIV infection in men who have sex with men. *the Lancet*, 380(9839), 367–377
- Cameron RP, & Gusman D (2003). The primary care PTSD screen (PC-PTSD): development and operating characteristics. *Primary Care Psychiatry*, 9(1), 9–14
- Daskalopoulou M, Rodger A, Phillips AN, Sherr L, Speakman A, Collins S, ... Fisher M (2014). Recreational drug use, polydrug use, and sexual behaviour in HIV-diagnosed men who have sex with men in the UK: results from the cross-sectional ASTRA study. *The lancet HIV*, 1(1), e22–e31 [PubMed: 26423813]
- Douglas-Vail M (2016). Syndemics theory and its applications to HIV/AIDS public health interventions. *International Journal of Medical Sociology and Anthropology*, 4(1), 081–090
- Dyer TP, Shoptaw S, Guadamuz TE, Plankey M, Kao U, Ostrow D, ... Stall R (2012). Application of syndemic theory to black men who have sex with men in the Multicenter AIDS Cohort Study. *Journal of Urban Health*, 89(4), 697–708 [PubMed: 22383094]
- Ferlatte O, Hottes TS, Trussler T, & Marchand R (2014). Evidence of a syndemic among young Canadian gay and bisexual men: Uncovering the associations between anti-gay experiences, psychosocial issues, and HIV risk. *AIDS and Behavior*, 18(7), 1256–1263 [PubMed: 24129844]
- Korhonen C, Kimani M, Wahome E, Otieno F, Okall D, Bailey RC, ... Mathenge J (2018). Depressive symptoms and problematic alcohol and other substance use in 1476 gay, bisexual, and other MSM at three research sites in Kenya. *AIDS (London, England)*, 32(11), 1507
- Lauby J, Zhu L, Milnamow M, Batson H, Bond L, Curran-Groome W, & Carson L (2017). Get real: Evaluation of a community-level HIV prevention intervention for young MSM who engage in episodic substance use. *AIDS Education and Prevention*, 29(3), 191–204
- Marshall BD, Operario D, Bryant KJ, Cook RL, Edelman EJ, Gaither JR, ... McGinnis KA (2015). Drinking trajectories among HIV-infected men who have sex with men: a cohort study of United States veterans. *Drug and alcohol dependence*, 148, 69–76 [PubMed: 25596785]
- Mimiaga MJ, O’CLEIRIGH C, Biello KB, Robertson AM, Safren SA, Coates TJ, ... Stall RD (2015). The effect of psychosocial syndemic production on 4-year HIV incidence and risk behavior in a large cohort of sexually active men who have sex with men. *Journal of acquired immune deficiency syndromes (1999)*, 68(3), 329 [PubMed: 25501609]

- Mustanski B, Garofalo R, Herrick A, & Donenberg G (2007). Psychosocial health problems increase risk for HIV among urban young men who have sex with men: preliminary evidence of a syndemic in need of attention. *Annals of Behavioral Medicine*, 34(1), 37–45 [PubMed: 17688395]
- Ogbuagu O, Marshall BD, Tiberio P, Ogunbajo A, Barakat L, Montgomery M, ... Edelman EJ (2018). Prevalence and Correlates of Unhealthy Alcohol and Drug Use Among Men Who Have Sex with Men Prescribed HIV Pre-exposure Prophylaxis in Real-World Clinical Settings. *AIDS and behavior*, 1–11
- Parsons JT, Grov C, & Golub SA (2012). Sexual compulsivity, co-occurring psychosocial health problems, and HIV risk among gay and bisexual men: further evidence of a syndemic. *American Journal of Public Health*, 102(1), 156–162 [PubMed: 22095358]
- Reback CJ, Fletcher JB, Swendeman DA, & Metzner M (2018). Theory-Based Text-Messaging to Reduce Methamphetamine Use and HIV Sexual Risk Behaviors Among Men Who Have Sex with Men: Automated Unidirectional Delivery Outperforms Bidirectional Peer Interactive Delivery. *AIDS and Behavior*, 1–11
- Reisner SL, Mimiaga MJ, Safren SA, & Mayer KH (2009). Stressful or traumatic life events, post-traumatic stress disorder (PTSD) symptoms, and HIV sexual risk taking among men who have sex with men. *AIDS care*, 21(12), 1481–1489 [PubMed: 20024727]
- Rodriguez-Hart C, Bradley C, German D, Musci R, Orazulike I, Baral S, ... Nowak RG (2018). The Synergistic Impact of Sexual Stigma and Psychosocial Well-Being on HIV Testing: A Mixed-Methods Study Among Nigerian Men who have Sex with Men. *AIDS and Behavior*, 22(12), 3905–3915 [PubMed: 29956115]
- Saunders JB, Aasland OG, Babor TF, De la Fuente JR, & Grant M (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction*, 88(6), 791–804 [PubMed: 8329970]
- Schwartz SR, Nowak RG, Orazulike I, Keshinro B, Ake J, Kennedy S, ... Baral SD (2015). The immediate effect of the Same-Sex Marriage Prohibition Act on stigma, discrimination, and engagement on HIV prevention and treatment services in men who have sex with men in Nigeria: analysis of prospective data from the TRUST cohort. *The Lancet HIV*, 2(7), e299–e306 [PubMed: 26125047]
- Stall R, Mills TC, Williamson J, Hart T, Greenwood G, Paul J, ... Catania JA (2003). Association of co-occurring psychosocial health problems and increased vulnerability to HIV/AIDS among urban men who have sex with men. *American journal of public health*, 93(6), 939–942 [PubMed: 12773359]
- Tsai AC, & Burns BF (2015). Syndemics of psychosocial problems and HIV risk: a systematic review of empirical tests of the disease interaction concept. *Social Science & Medicine*, 139, 26–35 [PubMed: 26150065]
- Vu L, Adebajo S, Tun W, Sheehy M, Karlyn A, Njab J, ... Ahonsi B (2013). High HIV prevalence among men who have sex with men in Nigeria: implications for combination prevention. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, 63(2), 221–227 [PubMed: 23406978]

Table 1.

Characteristics of Sample (N = 50).

	Mean	SD
Age (range 20–37)	27.1	4.7
Number of male sexual partners-Past 30 Days (range 0–10)	2.6	2.3
	N	%
Education		
Less than University	16	32.0
Some University or higher	34	68.0
Sexual Orientation		
Gay/Homosexual	34	75.0
Bisexual	16	32.0
Relationship Status		
Single, never married	35	70.0
Currently in a relationship	15	30.0
Employment Status		
Currently employed	32	64.0
Currently unemployed	18	34.0
Religious Affiliation		
Christian	45	90.0
Muslim/Moslem	5	10.0
HIV Status		
Negative/Unknown	32	64.0
Positive	18	36.0
Sexual Position		
Top (insertive partner)	11	22.0
Bottom (receptive partner)	19	38.0
Versatile (Both insertive & receptive partner)	20	40.0
Syndemics (n = 50)		
0	1	2.0
1	5	10.0
2	8	16.0
3	15	30.0
4	8	16.0
5	9	18.0
6	4	8.0
Depressive Symptoms (past week)		
Yes	28	56.0
No	22	44.0
Post-Traumatic Stress Disorder (lifetime)		

	Mean	SD
Yes	39	78.0
No	11	22.0
Alcohol Dependence (past 3 months)		
Yes	23	46.0
No	27	54.0
Tobacco Use (lifetime)		
Yes	28	56.0
No	22	44.0
Hard-Drug Use (lifetime)		
Yes	21	42.0
No	29	58.0
Exchange Sex (lifetime)		
Yes	28	56.0
No	22	44.0

Table 2.

Bivariate association among psychosocial health problems (N=50)

Psychosocial conditions	Odds ratio (95%CI)					
	Depressive Symptoms (past week)	Post-Traumatic Stress Disorder (lifetime)	Alcohol Dependence (past 3 months)	Tobacco Use (lifetime)	Hard Drug Use (lifetime)	Exchange Sex (lifetime)
Depressive Symptoms (past 7 days)						
Post-Traumatic Stress Disorder (lifetime)	2.80 (0.70–11.21)					
Alcohol Dependence (past 3 months)	1.44 (0.47–4.46)	5.25 (1.0–27.5)*				
Tobacco Use (lifetime)	1.11 (0.36–3.42)	1.73 (0.45–6.64)	2.86 (0.89–9.19)			
Hard Drug Use (lifetime)	1.52 (0.48–4.76)	2.29 (0.53–9.93)	4.44 (1.38–14.77)*	3.08 (0.93–10.18)		
Exchange Sex (lifetime)	1.11 (0.36–3.42)	0.21 (0.04–1.11)	1.44 (0.47–4.46)	1.55 (0.50–4.78)	0.78 (0.25–2.41)	

*
p<0.05

Table 3.

Association of interconnection of psychosocial health problems and self-reported number of male sex partners in last month and consistent condom use among Nigerian MSM (N=50)

Number of psychosocial health problems	Unadjusted number of male sexual partners in last month; β (SE)	Adjusted number of male sexual partners in last month; β (SE) ^a	Unadjusted odds ratio for Consistent Condom Use (95% CI)	Adjusted odds ratio Consistent Condom Use (95% CI) ^a
0–1	Ref	Ref	Ref	Ref
2–3	0.18 (0.82)	0.27 (0.83)	0.57 (0.10–3.41)	0.56 (0.09–3.43)
4+	2.22 (0.86)*	2.18 (0.88)*	0.25 (0.04–1.60)	0.24(0.04–1.61)

β =standardized beta

SE= standard error

CI= confidence intervals

^a Adjusted for age, HIV status, and education attainment.

*
p<0.05