Situational HIV stigma and stimulant use: A day-level autoregressive cross-lagged path model among HIV-positive gay and bisexual men

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HIGHLIGHTS

- Internalized HIV stigma was associated with subsequent increases in emotion dysregulation.
- Internalized HIV stigma was associated with later use of stimulant drugs.
- Emotion dysregulation was not associated with stimulant use.
- Emotion dysregulation did not explain the link between internalized stigma and drugs.

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ABSTRACT

Background: Data on the association between HIV stigma and drug use are scarce, but some research suggests that internalized HIV stigma may be associated with increased drug use and that this association may be at least partially mediated by emotion dysregulation. We sought to test this hypothesis with event-level data to more accurately tease out the co-occurrence of these phenomena.

Methods: We conducted a 21-day, twice-daily ecological momentary assessment study with a sample of 52 HIV-positive gay and bisexual men. We utilized multivariate multilevel path analysis to test an autoregressive cross-lagged model of the direct and indirect effects of situational-level internalized HIV stigma and emotion dysregulation on non-prescription stimulant drug use.

Results: As hypothesized, we observed significant concurrent effects of internalized HIV stigma on emotion dysregulation as well as autoregressive associations of internalized HIV stigma and emotion dysregulation with themselves across the day. Furthermore, findings revealed direct effects of internalized HIV stigma on later emotion dysregulation and increased likelihood of stimulant use, but no direct effect of emotion dysregulation on stimulant use.

Conclusions: Situational increases in internalized HIV stigma appear to exert a direct risk-enhancing effect on the likelihood of daily stimulant drug use and do not appear to do so through emotion dysregulation. Future research is needed to more carefully examine distinct affective experiences and regulation strategies to better understand what mechanism links internalized HIV stigma with drug use behaviors.

1. Introduction

HIV stigma has several well-documented associations with adverse mental health outcomes for people living with HIV, including depression (Chaudoir et al., 2012; Rao, Feldman, Fredericksen, et al., 2012; Wright, Naar-King, Lam, Templin, & Frey, 2007), anxiety (Tomassilli, Parsons, & Golub, 2013; Varni, Miller, McCuin, & Solomon, 2012), general distress (Miller et al., 2016), and low self-esteem (Turan, Budhwani, Fazeli, et al., 2017). Internalized HIV stigma, whereby

negative societal attitudes become directed towards oneself, has been shown to be particularly problematic for its effects on mental health and health behaviors among both general samples of HIV-positive individuals (Katz, Ryu, Onuegbu, et al., 2013; Rueda, Mitra, Chen, et al., 2016; Sayles et al., 2008; Sweeney & Vanable, 2016; Turan et al., 2017; Turan, Smith, Cohen, et al., 2016) and among HIV-positive gay and bisexual men (GBM), specifically (Berg, Carter, & Ross, 2017; Dowshen, Binns, & Garofalo, 2009; Hatzenbuehler, O'Cleirigh, Mayer, Mimiaga, & Safren, 2011; Rendina et al., 2017; Rendina, Golub, Grov, & Parsons,

2012; Wohl, Galvan, Carlos, et al., 2013). In particular, rates of drug use and related problems are disproportionately higher for GBM in general as compared to their heterosexual peers (Green & Feinstein, 2012; McCabe, West, Hughes, & Boyd, 2013) and, among GBM, disproportionately higher among HIV-positive compared to HIV-negative individuals (Schmidt, Bourne, Weatherburn, et al., 2016). Among GBM, non-prescription stimulant drugs such as cocaine/crack and crystal methamphetamine are among the most frequently reported illicit drugs used (Carrico, Johnson, Moskowitz, et al., 2007; Grov, Bimbi, Bimbi, & Parsons, 2006; Lea et al., 2013; McCabe, Hughes, Bostwick, West, & Boyd, 2009; Skinner, 1994), and consequences of their use have included greater HIV transmission risk behavior and lower antiretroviral medication adherence (Lelutiu-Weinberger et al., 2013; Li & McDaid, 2014; Parsons, Kowalczyk, Botsko, Tomassilli, & Golub, 2013; Rendina, Moody, Ventuneac, Grov, & Parsons, 2015). Furthermore, stimulants such as cocaine/crack and crystal methamphetamine are known to have significant HIV-related health consequences, such as increased viral replication (Baum et al., 2009; Massanella, Gianella, Schrier, et al., 2015; Shoptaw, Stall, Bordon, et al., 2012), inflammation (Roth, Whittaker, Choi, Tashkin, & Baldwin, 2005), and quickened progression to AIDS (Carrico, Shoptaw, Cox, et al., 2014).

One prominent model for understanding the disproportionate burden of negative health outcomes observed among GBM is the minority stress model (Hatzenbuehler, 2009; Hatzenbuehler, Nolen-Hoeksema, & Erickson, 2008; Meyer, 1995; Meyer, 2003). In both theoretical and empirical work, the link between sexual minority stress and behavioral outcomes such as drug use among GBM has been posited to operate through the mediating factor of emotion dysregulation (Feinstein & Newcomb, 2016; Hatzenbuehler, 2009; Lelutiu-Weinberger et al., 2013; McCabe, Bostwick, Hughes, West, & Boyd, 2010). Prior research has shown consistent effects of both sexual minority and HIV-related stigma on emotion dysregulation for HIV-positive GBM (Rendina et al., 2017), and that emotion dysregulation mediates the effect of these forms of stigma on negative mental health, sexual risk behavior, and substance use outcomes (Hatzenbuehler et al., 2008; Pachankis et al., 2015; Rendina et al., 2017). As such, there is a growing empirical basis for theorizing that stigma may lead to behaviors such as drug use through emotion dysregulation, whereby an individual experiences both behavioral disinhibition as well as a drive to seek such behavioral experiences in order to improve positive mood or distract from negative mood.

While a growing body of evidence has shown the links between HIV stigma and emotion dysregulation as cited above, research on HIV stigma's direct association with substance use has been relatively scarce and has focused mostly on heterosexual samples (Edelman, Lunze, Cheng, et al., 2017; Lunze, Lioznov, Cheng, et al., 2017; Wolitski, Pals, Kidder, Courtenay-Quirk, & Holtgrave, 2009; Wright et al., 2007). We are aware of only two studies looking at the association between HIV stigma and substance use in GBM: one that demonstrated a non-significant association between HIV stigma and alcohol dependency (Berg et al., 2017), and another that showed that, among young Black GBM,

those with greater HIV stigma reported higher odds of having sex while high or intoxicated (Radcliffe et al., 2010). Further investigation in this area is therefore needed, especially given the elevated rates of drug use among HIV-positive GBM, the link between emotion dysregulation and stimulant use (Carrico et al., 2007), and the detrimental effects of use on various HIV-related health outcomes (Carrico et al., 2007; Tucker, Burnam, Sherbourne, Kung, & Gifford, 2003).

Most of the aforementioned research on the mental and behavioral health effects of HIV stigma has focused on links between global or enduring levels of HIV stigma and aggregate outcomes (e.g., depression, substance use dependency). However, a more temporally-precise understanding of the co-occurrence of HIV stigma and health outcomes has been provided by two recent studies looking at day-level associations. In the first study, Fazeli et al. showed a positive association between enacted and internalized HIV stigma using a 7-day experience sampling design (Fazeli, Turan, Budhwani, et al., 2016). In the second study, Rendina et al. showed a positive effect of situationally-fluctuating levels of internalized HIV stigma measured once daily on negative affect and emotion dysregulation using a 21-day ecological momentary assessment (EMA) design (Rendina, Millar, & Parsons, 2018). No study of which we aware has yet looked at event-level associations between HIV stigma and drug use, though three recent daily diary studies on sexual minority stigma among GBM—one showing that daily sexual minority stigma was associated with increased negative affect (Eldahan et al., 2016), one showing that individual-level sexual minority stigma was associated with increased odds of alcohol and tobacco use on a given day (Pachankis, Hatzenbuehler, & Starks, 2014), and another showing that daily sexuality-based discrimination was associated with both daily nicotine and substance use (Livingston, Flentje, Heck, Szalda-Petree, & Cochran, 2017)—further support the possibility that daily fluctuations in levels of internalized HIV stigma may be associated at an event-level with the experience of emotion dysregulation and drug use.

Building upon the existing data, the purpose of the present study was to examine an event-level, autoregressive cross-lagged path model of internalized HIV stigma, emotion dysregulation, and use of non-prescription stimulant drugs among HIV-positive GBM participating in a twice-daily, 21-day EMA study. As depicted in Fig. 1, we hypothesized the following: (1) concurrent effects whereby afternoon levels of internalized HIV stigma would be positively associated with afternoon levels of emotion dysregulation (curved Path A) and the same would be true for the nighttime measurements (curved Path F); (2) autoregressive effects whereby afternoon levels of internalized HIV stigma would be positively associated with nighttime levels of internalized HIV stigma (Path B) and the same would be true for emotion dysregulation (Path C); (3) a positive cross-lagged effect of afternoon levels of internalized HIV stigma on nighttime levels of emotion dysregulation (Path E); (4) a positive direct effect of nighttime levels of emotion dysregulation on subsequent stimulant drug use (Path H); and (5) positive indirect effects (i.e., mediation) of afternoon internalized HIV stigma on stimulant drug use through nighttime emotion dysregulation (Path E–H). Based on the
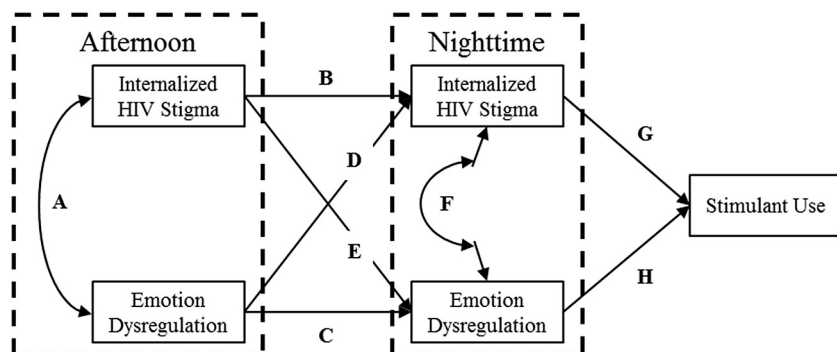

Fig. 1. This figure displays the specific paths being tested within the autoregressive cross-lagged path model that are used in text to reference specific hypotheses regarding concurrent associations (curved paths A and F), autoregressive effects (paths B and C), cross-lagged effects (paths D and E), and the direct effects on subsequent stimulant use (paths G and H).