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Predictors of correspondence between self-reported substance use and urinalysis screening among a racially diverse cohort of young men who have sex with men and transgender women

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HIGHLIGHTS

- Prevalence of most illicit drugs among YMSM/TW is < 15%.
- Validity of recent illicit drug use self-reports is low except for marijuana.
- Black and gender-minority YMSM/TW are less likely to disclose use of some drugs.
- Participation in research introduces no bias or increasing honesty for disclosure.
- Drug use epidemiological studies should include biomarker screening when feasible.

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ABSTRACT

It is unknown if estimates of illicit drug use among young men who have sex with men and transgender women (YMSM/TW) may be biased due to historical distrust of research or reliable due to more accepting norms for use. Research is needed to examine the validity of drug use self-reports among YMSM/TW.

Data came from an ongoing longitudinal study of YMSM/TW aged 16–29 living in Chicago (analytic $N = 1029$). Baseline urinalysis screens for marijuana, ecstasy, amphetamine, methamphetamine, cocaine, benzodiazepine, and opiate metabolites were compared to self-reported use within different recall periods using measures of concordance. Generalized estimating equations logistic regressions were conducted on three waves of data to identify predictors of disclosing past-6-month use of marijuana and non-marijuana drugs.

Past-6-month self-reported use of all non-marijuana substances was < 15%. There was excellent agreement between self-reported and drug-tested marijuana use. For other substances, sensitivities within the urinalysis detection window were < 0.5 but increased with longer recall periods. Black participants had lower odds of disclosing non-marijuana drug use. Gender minority participants had lower odds of disclosing marijuana use. Participants with a history of arrest had higher odds of disclosing both marijuana and non-marijuana drug use. Wave and year of first research participation were non-significant, suggesting no systematic bias or increasing honesty associated with longer research participation.

Programs that rely on self-identification of non-marijuana illicit substance use may be missing a substantial portion of drug-using YMSM/TW. Future epidemiological studies should work to reduce social desirability biases and include biomarker-based drug screenings to increase validity.

1. Introduction

Accurate measurement of substance use is critical to epidemiological understanding and the subsequent prevention and service interventions that arise from that foundation (Hunt et al., 2015). However, most research continues to rely on self-reported substance use behaviors. Sources of bias in such data are extensive and encompass many issues of measurement error (Johnson, 2014). Certain cognitive (e.g., social desirability) and situational factors (e.g., perceptions of confidentiality within the interview setting) have been linked to

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underreporting behaviors deemed unfavorable (Brener, Billy, & Grady, 2003; Johnson & Fendrich, 2005), including substance use (Fendrich, Johnson, Wislar, Hubbell, & Spiehler, 2004). Other factors such as memory difficulties have been shown to predict over-reporting (Johnson & Fendrich, 2005).

Previous research has found variability in the validity of self-reported substance use by drug type, age, setting, education, socioeconomic status, region, and time (Fendrich, Mackesy-Amiti, & Johnson, 2008; Hunt et al., 2015; Mackesy-Amiti, Fendrich, & Johnson, 2008). Consistent across studies is lower reliability among racial/ethnic minorities (Fendrich & Johnson, 2005; Hunt et al., 2015; Johnson, 2014; Johnson & Bowman, 2003; Richardson, Fendrich, & Johnson, 2003). Concerns about confidentiality, cultural distrust due to histories of mistreatment by researchers, and fear of legal consequences have been posited as possible explanations (Johnson & Bowman, 2003; Richardson et al., 2003). Johnson and Fendrich (Johnson & Fendrich, 2005) reported that, among a general population sample, measurement error among Black adults—but not White or Hispanic adults—was significantly associated with social desirability.

While evidence suggests most youth and young adults accurately report recent drug use (Harrison, Martin, Enev, & Harrington, 2007), histories of experiencing stigma and judgement in psychological, medical, and research settings (Bauer & Wayne, 2005; Burke et al., 2015; Magura & Kang, 1996; Mohr, 2009) might lead young men who have sex with men and transgender women (YMSM/TW) to minimize their reports of drug use in ways that are similar to minimizations by racial/ethnic minorities. Alternatively, prior literature has described norms more accepting of drug use (Kecojevic, Corliss, & Lankenau, 2015; McKay, McDavitt, George, & Mutchler, 2012; Tobin, Davey-Rothwell, Yang, Siconolfi, & Latkin, 2014), which may enhance willingness to disclose in research studies connected with the LGBT community (Fendrich et al., 2008; Mackesy-Amiti et al., 2008). Given that the majority of research involving YMSM/TW has been in the context of HIV/AIDS, YMSM/TW may also be more comfortable reporting on substance use when they have already disclosed other sensitive information like sexual orientation or high-risk sexual behavior (Fendrich et al., 2008; Mustanski, 2011).

Little research on this topic has been conducted with YMSM/TW, though two studies from the same sample found that the correspondence of self-report and objective drug use was roughly equivalent between MSM and general population males (Fendrich et al., 2008; Mackesy-Amiti et al., 2008). For YMSM specifically, Fendrich et al. (Fendrich et al., 2008) found no differences in underreporting cocaine or marijuana use relative to older MSM. Compared to young males in the general population, however, YMSM were more likely to self-report past-year use of ecstasy, inhalants, ketamine, methamphetamine, and tranquilizers/sedatives but not past-month substance use (Mackesy-Amiti et al., 2008). Those differences dissipated after adjusting for underreporting among the general population young males, suggesting that the YMSM self-reports were more valid.

Given the dearth of research in this area on YMSM/TW, who are particularly affected by the substance use epidemic (Marshal, Friedman, Stall, & Thompson, 2009; Newcomb, Birkett, Corliss, & Mustanski, 2014) as well as its association with HIV (Mustanski, Andrews, Herrick, Stall, & Schnarrs, 2014; Mustanski, Garofalo, & Donenberg, 2007), it is important to quantify the extent of measurement error and identify factors associated with inaccuracies. Additionally, the intersection of sexual orientation and race/ethnicity should be explored. Mistrust of the medical establishments has been shown to be high among Black MSM (Eaton et al., 2015), possibly contributing to the lower validity of drug use self-reports observed among racial/ethnic MSM (White et al., 2014). The current study aimed to assess the concordance between drug use self-reports and urinalysis drug screens and to examine predictors of non-correspondence among a large, racially diverse sample of YMSM/TW.

2. Methods

2.1. Design and procedures

Data came from RADAR, a cohort study of HIV risk and substance use among YMSM/TW living around Chicago, IL. Using an accelerated longitudinal design (Miyazaki & Raudenbush, 2000), we recruited YMSM/TW from three previous studies, conducted in 2008, 2011, and 2015, as well as newly recruited individuals (also in 2015) to form the new RADAR cohort. This process has been described in detail elsewhere (Mustanski, Swann, Newcomb, & Prachand, 2017; Newcomb, Moran, Feinstein, Forscher, & Mustanski, 2017). Individuals were eligible for RADAR if they were 16–29 years old, were assigned male at birth, spoke English, and either reported a sexual encounter with a man in the previous year or identified as gay or bisexual.

Data collection occurred every 6 months. Each study visit included a computer-assisted self-interview (CASI) and collection of biological specimens, including urine for drug screening and STI testing. All participants were informed of and consented to the drug screening, which was processed on site (cf. STI testing, which was processed by an off-site laboratory). Participants were informed and directed to a healthcare provider if they tested positive for STIs; results of the drug screen were not reported back to participants. Participants provided written consent and received $50 in compensation each visit. Study activities were approved by the Institutional Review Board at Northwestern University with waivers of parental permission for minors (Mustanski, 2011). Baseline data collection for RADAR began in February 2015 and closed to primary recruits in April 2017; follow-up visits are ongoing. The current study used data from the first three waves collected through May 2017. At the time of analysis, 1029 YMSM/TW had completed a baseline survey, 842 had completed Wave 2, and 599 had completed Wave 3.

2.2. Measures

2.2.1. Urine drug screen

Urine samples were tested with the Ecstasy Drug Test (DMD-114) and Multi-Drug Screen Test Panel (DOA-264) dip cards from Innovacon, Inc. (San Diego, CA), to detect metabolites of the following seven drugs: methylenedioxymethamphetamine (MDMA), marijuana, cocaine, opiates, amphetamines, methamphetamine, and benzodiazepines. Sensitivities for the urine screens compared to gas chromatography/mass spectrometry ranged from 96% (cocaine) to > 99% (opiates); specificities ranged from 90% (cocaine) to > 99% (MDMA) (Innovacon Inc., 2018). Estimated detection periods for each substance are described below.

2.2.2. Self-reported substance use

At each visit, participants were asked to select, from a list, any substances they used in the past 6 months, including ecstasy, marijuana, cocaine, heroin, methamphetamines, prescription stimulants (e.g., Adderall, Concerta), prescription painkillers (e.g., Vicodin, Codeine), and prescription depressants/tranquilizers (e.g., Ativan, Klonopin). Endorsement of a substance triggered a question asking how many occasions they used that substance in the past 30 days. At baseline only, those who endorsed past-6-month substance use were also asked how many days it had been since they last used that drug.

Responses to the recency question were matched to urinalysis detection windows for each drug to assess whether participants reported using that drug within the detectable period. Detection windows were determined from the test product insert (Innovacon Inc., 2018) or, when not explicitly stated, estimated from a SAMHSA technical assistance publication (Substance Abuse and Mental Health Services Administration, 2012). Window periods based on the product insert were 1–2 days for cocaine, 3–5 days for methamphetamines, 3–7 days for benzodiazepines, and 3–10 days for marijuana. Those based on the