Original Research

Journal of Behavioral Health
www.scopemed.org
DOI: 0.5455/jbh.20150810020247

Sex-related marijuana expectancies of social desirability among detained male and female adolescent offenders in the USA

Torrance T Stephens

Department of Psychology, Clark Atlanta University, Political Science, Atlanta, Georgia, USA

Address for Correspondence:
Torrance T Stephens, Departments of Psychology, Clark Atlanta University, Political Science, Atlanta, Georgia, USA.
E-mail: tstephensphd@gmail.com

Received: May 20, 2015
Accepted: July 30, 2015
Publishing: August 11, 2015

ABSTRACT

Background: Research supports that adolescents involved with the criminal justice system engage in significantly more sexual risk behaviors than those never adjudicated, including use of drugs prior to/during sexual intercourse. Previous research has focused on incarcerated adolescents, with limited if any attention on the tenable relationship between social desirability with respect to marijuana (MJ) use on sexually transmitted infections (STIs) risk practices. The purpose of this investigation is to conduct an exploratory study designed to identify differences, if any, in terms of MJ use and social desirability as it pertains to risk for STIs among a sample of adolescent offenders in Georgia as a function of gender. **Methods:** Participants were 2277 juvenile offenders housed at selected Youth Development Campuses (YDCs) in the state of Georgia. Frequencies and descriptive statistics were performed prior to hypothesis testing to describe male and female adolescent offenders and ANOVA was selected for a detailed examination of variation in items possible range of scoring self-reported MJ social by respondents' gender. **Results:** Significant differences between male and female adolescent offenders regarding the belief that using MJ made them feel closer to a sexual partner ($F = 61.81$, $P = 0.001$), being more sexually responsive ($F = 82.50$, P = 0.001), less nervous about sex ($F = 50.98$, $P = 0.001$) and to have sex with people they normally would not have sex with ($F = 156.20$, $P = 0.001$) were observed. In all cases, male respondents being more likely than females to agree with the aforementioned statements. Females in our sample were also more than males to disagree with using MJ made sex more enjoyable with ($F = 93.67$, $P = 0.001$), made them a better lover with ($F = 108/19$, $P = 0.001$) or make them less likely to take protective precautions when having sex with ($F = 74.75$, $P = 0.001$). **Conclusion:** The present findings further suggest that associations of MJ use and sexual risk behavior can be moderated by individual difference variables, including MJ expectancies.

KEY WORDS: Adolescent offenders, marijuana, sex-related marijuana expectancies, sexual risk taking, social desirability, substance use

INTRODUTION

Retrospective epidemiological studies show that adolescent detainees are at increased risk for sexually transmitted infections (STIs), inclusive of the human immunodeficiency virus (HIV) [1-6]. The literature notes a multitude of causal factors including substance use behavior [7,8], history of prior STIs [1,2,9] and sexual risk taking [10,11] as being significant contributors to the high rates of STIs among this population. Moreover, it is well documented that behaviors such as inconsistent condom use and having multiple sex partners are associated with substance use as well as with the occurrence of STIs in adolescents [12-15].

A major and persistent public health problem in the United States, adolescent substance use continues to contribute greatly to rates of STI morbidity among this population. It is reported that 10.1% of youths aged 12-17 use illicit drugs and 13.3% of these youths use alcohol [16]. In addition, rates are considerably higher among at-risk adolescent populations including but not limited to ethnic minorities, underprivileged youth and incarcerated juveniles [17-20]. For example, rates of substance use among adolescents exposed to violence, with substance-abusing parents and of low socioeconomic status, are considered to be 2-5 times higher than that of adolescents without these risk factors [21,22]. It is also well documented that early start of substance use is correlated with an increased risk of multiple problem behaviors [23,24]. Consequently, it is not unusual for adolescents with a history of substance use to face future legal issues, incarceration, academic failure, unemployment and an increased likelihood of developing associated mental health symptoms and co-morbidity [15,25,26].

In addition, health behaviors are frequently associated with psychosocial constructs. One such construct is social desirability, which has been associated with several preventive health behaviors [27-32]. Social desirability refers to the tendency of an individual to attribute to themselves statements which are desirable and reject those which are undesirable [33,34].

Research supports that adolescents involved with the criminal justice system engage in significantly more sexual risk behaviors than those who were never adjudicated, including multiple partners and/or use of drugs prior to and during sexual intercourse [35], placing adolescent offenders at elevated risk for contracting and spreading STIs. Some have reported that around 75% of arrested adolescents have indications of some form of substance use involvement [36]. This may reflect that the use of substances such as MJ might reduce inhibition by enhancing the likelihood of being more influenced by social networks and peer pressure, both of which are influenced by social desirability. Thus smoking MJ may also reduce intentions to engage in safer sex and thus encourage behaviors that enhance the risk of STIs among adolescent offenders.

Although a growing body of research has identified many risk factors for adolescent substance use, comparatively little consideration has been given to the unique role of social desirability. Previous research has focused on incarcerated adolescents, with limited if any attention on the tenable relationship between social desirability with respect to MJ use on STI risk practices. There is to our knowledge, no published data pertaining to what if any, social desirability plays in increased risk for contracting and STI as a function of specific drug use like MJ. Despite the evidence linking social desirability to health behavioral outcomes and the impact of substance use on enhanced risk for STI, there remains a paucity of research conducted to assess whether MJ use specifically among adolescent offenders mediates or moderates increased risk for STI occurrence among this population in terms of sex-related MJ expectancies of social desirability. Thus examining social desirability among adolescent offenders is essential if we are to engender more effective prevention programs for this population. First it is essential to identify and understand personal level factors such as social desirability that influence adolescent sexual behavior specifically among adolescent offenders given the rates of STI and other problem behaviors are more prevalent among this population than the general adolescent population.

The purpose of this investigation is to conduct an exploratory study designed to identify differences, if any, in terms of MJ use and social desirability as it pertains to risk for STIs among a sample of adolescent offenders in Georgia as a function of gender. This study will examine self-reported data and our analysis was designed to evaluate the null that there would be no differences between adolescent juvenile offenders social desirability regarding the use of MJ and increased STI risk taking regardless of participants gender. This study is significant because it extends the current body of scientific information regarding STI risk practices and the construct of social desirability as it pertains to increased risk for STIs by analyzing data from a sample of adolescent juvenile offenders in Georgia.

METHODS

Participants were 2277 juvenile offenders housed at selected Youth Development Campuses (YDCs) in the state of Georgia. The YDCs were gender specific and operated under the auspices of the State Department of Juvenile Justice. Adolescents sentenced to theses YDCs during the study period were approached by health educators within the first 3 days of being admitted into the facilities, presented with an overview of the study and asked to participate. They were informed that being apart of this study was voluntary and that all information would be private and unavailable to YDC staff. Adolescents who agreed to take part in the study signed an assent formed that gave members of the research team permission to contact their parents and/or legal guardian for their approval for participation. Prior to study implementation, approval was obtained from the university and the Department of Juvenile Justice Institutional Review Boards.

The questionnaire was interviewer administered and was administered within the 1st month after admittance in the YDCs by trained staff recruited from the communities located around the YDCs. Specific details regarding the complete methodology are described by Robillard *et al.*, (2006) [10]. The survey items were written at a fourth-grade reading level as confirmed by the fry index, 13 whereas the survey instructions tested at least a high school reading level. Scaled responses and skip patterns added to the difficulty of some questions.

Measures

Demographics: Participants reported their age, race, and years of formal education, years incarcerated, and history of prior arrests.

Sex-related MJ expectancies for social desirability: Sex-related MJ expectancies of social desirability were evaluated using an adapted measure of sex-related alcohol expectancies [37]. Participants responded to 23 items covering sex-related MJ expectancies for social desirability. The adapted measure was identical to the original measure except that items were modified to reflect MJ rather than alcohol. The measure includes three subscales: Sexual enhancement (e.g. "After smoking MJ, I am more sexually responsive"), sexual risk (e.g., "After smoking MJ, I am less likely to use birth control"), and sexual disinhibition (e.g. "After smoking MJ, I find it hard to say no to sexual advances)." Expectancies were assessed on a 7-point scale (0 = strongly disagree to 6 = strongly agree), with higher numbers indicating relatively stronger expectancies about MJ's social desirability effects on sexual enhancement, risk or disinhibition. Inter-item correlations showed good reliability coefficients for the enhancement ($\alpha = 0.95$), risk ($\alpha = 0.94$) and disinhibition ($\alpha = 0.93$) subscales.

Analysis

The data were analyzed using the Statistical Package for the Social Sciences version 18 for Windows. Frequencies and

descriptive statistics were performed prior to hypothesis testing to describe male and female adolescent offenders. A classical parametric test for significance (two-tailed ANOVA) was employed. ANOVA was selected over *t*-test given it allows for more detailed examination of variation in items possible range of scoring self-reported MJ social desirability (0 = strongly disagree to 6 = strongly agree) by respondents' gender. Also, conducting multiple t-tests can generate false positives, therefore even given the robust nature of this data set and its consistency with the overall direction of the results across all social desirability variables, ANOVA was selected to conservatively evaluate respondent's self-reported beliefs. Findings were considered as significant at $P < 0.05$. Thus, continuous data are expressed in means and standard deviations.

Findings

Demographics: Overall, participants ranged in age from 11 to 18 years (mean 15.2 [standard deviation [SD] 1.16]), with males being older than females regardless of having ever considered attempting suicide. Most were female (58.7%), African American (66.9%) and had been incarcerated previously (55.6%). The majority of male respondents were African American (56.3%, $n = 529$) followed by white (37.7%, $n = 354$) compared to 57.1% ($n = 764$) and 36.3% ($n = 486$) for African American and white females respectively.

Mean age for females was 14.87 years (SD = 1.24) whom on average had spent 22.8 days incarcerated at time of survey administration (SD = 23.45) reporting average ages of first drinking alcohol and smoking MJ to be 12.8 (SD = 2.11) and 12.9 (1.73) years accordingly. Males reported having spent 25.4 (SD = 21.45) days incarcerated at time of survey administration with mean ages of first drinking alcohol and smoking MJ to be 12.7 (SD = 2.39) and 12.4 (2.11) years respectfully. Their overall mean age was 15.6 years (SD = 0.88).

Sexually active males ($n = 862$) reported age of first having vaginal sex at 12.8 years (SD = 1.77) and oral sex at 14.1 ($n = 284$, SD = 1.67) years. In comparison, sexually active female adolescent offenders ($n = 1156$) reported age of first having vaginal sex at 13.4 years (SD = 1.38) and oral sex at 14.1 ($n = 288$, SD = 1.50) years. Additional demographic information of sample characteristics by gender is detailed in Table 1.

Sex-related MJ expectancies of social desirability: No statically significant differences were found for measures of participants reporting that MJ made them feel freer to be themselves and do what they wanted, reporting that MJ allowing them to be more assertive, or MJ making it is easier for them to express their feelings (all $P > 0.137$). However, male study participants were significantly more likely to indicate that smoking MJ made it easier for them to open up ($F = 6.06$, $P = 0.014$), gave them more confidence ($F = 11.26$, $P = 0.001$), and made it easier for them to talk with the opposite sex ($F = 12.90$, $P = 0.001$).

There were also significant differences between male and female adolescent offenders regarding the belief that using MJ made them feel closer to a sexual partner ($F = 61.81$, $P = 0.001$), being more sexually responsive ($F = 82.50$, $P = 0.001$), less nervous about sex ($F = 50.98$, $P = 0.001$), less likely to use birth control ($F = 33.76$, $P = 0.001$) and to have sex with people they normally would not have sex with ($F = 156.20$, $P = 0.001$). In all cases, male respondents being more likely than females to agree with the aforementioned statements.

Females in our sample were also more than males to disagree with using MJ made sex more enjoyable with ($F = 93.67$, $P = 0.001$), made them a better lover with ($F = 108/19$, $P = 0.001$) or make them less likely to take protective precautions when having sex with ($F = 74.75$, $P = 0.001$). Likewise, they were more than males to disagree with smoking MJ made them less likely to talk about STDs ($F = 82.57$, $P = 0.001$), more likely to do sexual things ($F = 113.33$, $P = 0.001$), less likely to use a condom ($F = 56.31$, $P = 0.001$) or more likely to have sex on the first date ($F = 442.52$, $P = 0.001$). All mean scores and levels of significance comparing males with female study participants on MJ use and social desirability are detailed in Table 2.

DISCUSSION

The aim of this study was to examine social desirability regarding the use of MJ and increased STI risk taking in a sample of adolescent juvenile offenders in Georgia. We hypothesized that those adolescent juvenile offenders, sex-related MJ expectancies of social desirability, would report no statistically significant differences in terms of gender. Our findings reveal that there were several major levels of difference between adolescent offenders based on gender. On a basic level, it was observed that difference occurred across all ranges of MJ use for social enhancement, sexual risk taking and disinhibition with males agreeing with it increased their sexual risk taking practices more so than female respondents. Of particular interest was that females reported consistently lower levels of sexual risk taking.

Table 1: Demographic profile of study participants by gender (n=2277)

Variable	%/*n*	
	Male (n=939)	Female (n=1338)
Race/ethnicity		
White	37.7 (354)	36.3 (486)
Black	56.3 (529)	57.1 (764)
Hispanic	2.6 (24)	1.9 (25)
Asian	1.1 (10)	0.4 (6)
Native American	0.3 (3)	0.4 (6)
Other	2.0 (19)	3.8 (51)
Highest grade finished		
4th	0.0 (0)	0.2 (3)
5th	0.0 (0)	2.4 (32)
6th	1.4 (13)	6.9 (92)
7th	10.1 (94)	18.4 (245)
8th	34.5 (323)	31.6 (420)
9th	33.2 (310)	24.5 (325)
10th	16.5 (154)	13.5 (179)
11th	4.1 (38)	2.2 (29)
12th	0.3 (3)	0.2 (3)
History of prior incarceration		
Yes	58.5 (549)	53.4 (714)
No	41.5 (389)	46.6 (622)

Table 2: Mean and SD of individual sex-related marijuana expectancies of social desirability items and significance (*F* probability)

Item	Mean		SD		Significant
	Male	Female	Male	Female	
MJ, it is easier to open up	3.0208	2.6201	2.32	2.22	0.014
MJ gives me confidence	2.5516	1.9758	2.20	2.03	0.001
MJ, I feel freer to be myself and do	3.0822	2.6373	2.28	2.21	0.189
MJ allows me to be more assertive	2.8156	2.2808	2.22	2.13	0.137
MJ, talking with members of opposite sex	2.8835	1.9984	2.30	2.09	0.001
MJ, it is easier to express my feelings	3.0175	2.5227	2.28	2.23	0.664
MJ, no worry about what others think of me	3.2697	2.8672	2.31	2.30	0.189
MJ, it is easier to talk to people	2.9967	2.4887	2.24	2.17	0.639
MJ, I feel less shy	3.0559	2.5991	2.30	2.25	0.580
MJ, easier to act on my feelings	3.0230	2.5511	2.24	2.21	0.921
MJ, I feel closer to a sexual partner	3.2746	2.0996	1.91	1.64	0.001
MJ, I am more sexually responsive	3.4075	2.0796	1.92	1.64	0.001
MJ, I am less nervous about sex	3.3800	2.2502	1.96	1.74	0.001
MJ, less likely to use birth control	2.4733	1.9824	1.80	1.67	0.001
MJ, have sex with people I wouldn't	2.1020	1.5473	1.64	1.24	0.001
MJ, I enjoy sex more than usual	3.3936	2.1068	1.97	1.69	0.001
MJ, I am a better lover	2.9254	1.9137	1.90	1.59	0.001
MJ, less likely to take precautions	2.5383	1.8808	1.81	1.57	0.001
MJ, less likely to talk about STI	2.5255	1.9004	1.86	1.61	0.001
MJ, more likely to do sexual things	2.6256	1.8486	1.83	1.53	0.001
MJ, harder to say no to sexual advances	2.9889	1.8617	1.92	1.51	0.001
MJ, less likely to use a condom	2.5239	1.9339	1.83	1.66	0.001
MJ, more likely to have sex on a first date	3.2100	1.6547	2.02	1.41	0.001

MJ: Marijuana, STI: Sexually transmitted infections, SD: Standard deviation

It is apparent that early substance use interdiction would be a viable component in the reduction of sexual risk taking behaviors among adolescent offenders regardless of gender, in particular for males. Therefore, it is essential to continue examining these behaviors among adolescents involved in the juvenile justice system since the occurrence of STIs remains a major health problem for this population [38,39]. In addition, it may be wise to note that sexual risk practices among adolescents is a difficult problem to understand completely from a preventive health purview since it has involves other significant social, structural and environmental correlates as well [38]. Thus, adolescents admitted to juvenile corrections facilities may require additional resources and culturally/gender competent interventions, to target those characteristics that have the greatest influence on behavioral change [40-42].

Also, since most arrested youths spend little time in custody and quickly return to the community [43], and are not regularly screened for STIs, it is important to estimate such risk among the broadest possible juvenile justice population. Namely because detained youths spend short time periods in custody, making screening at admission more important as well as the need to develop gender specific risk reduction interventions for delinquent youths [44,45]. This need is even more paramount with racial/ethnic adolescents whom for example, are disproportionately represented in the juvenile justice system and maintain excessively high rates of STIs compared to the general population [46,47]. The high levels of sexual risk taking among recently arrested youths may reflects in part their relatively high rates of drug and decision making associated with substance use such as MJ, as observed with incarcerated populations in general globally, compared with adolescents without a history of incarceration [48-52].

Our findings may also suggest that differences in brain activity as a function of MJ use may manifest between adolescent males and females. It is well documented that MJ, stimulates brain dopamine (DA) signaling in the nucleus accumbens (NAc) [53,54] which is one way noted in the literature that serves to enhance the perception of the rewarding effects of its use [55,56]. NAc are part of the mesolimbic pathway basal ganglia (ventral striatum) and play a major role in cognitive processing of motivation, reward and pleasure. Some have asserted that this means that it is not unlikely that the use of MJ may trigger "the neuroadaptations that result in an increase DA release in striatum (including the nucleus accumbens)," which have been associated with the subjective experience of reward in clinical investigations [57,58]. One study in rats observed male and female differences in brain Cannabinoid CB1 Receptor Density and Function [59], however it is difficult to verify and is speculative since few have investigated CNS activity as a function of decision making and MJ use in humans [60].

Notwithstanding, substance use and sexual risk taking by this population continues to be issues that must be addressed from a community and mental health perspective [6,8,11,17,25,44,61,62]. Thus, the subject of the prevention of STI occurrence will require a multi-disciplinary approach that will make use of the behavioral, medical and social sciences as well as legal professionals in order to yield novel and innovative intervention programs that have proven scientific evaluation.

Limitations

Several limitations of our study should be noted. Our protocol did not include testing for the actual occurrence of STI among

study participants not a review of medical records that would present us with evidence of past occurrence of ever having had a STI. In addition, our data from a large southern region does not necessarily generalize to adolescent offenders in other geographic regions. Moreover, the results of this study must also be understood in reference to several methodological limitations. First, it was implemented in juvenile detention centers as opposed to community settings. This may lead to spurious findings when compared to the general adolescent population, particularly because this study oversampled female juvenile offenders. An additional limitation may be related to the instrumentation. Self-report measures may lead to response bias, and there may be a need to develop more effective, accurate and sensitive screening tools pertaining to this population [63,64]. Although we did employ self-report measures on health status, we feel that our sample size was random and large enough to validate the findings presented herein.

Also, findings should be taken in context with the limitations of examining sex-related MJ expectancies of social desirability, which presume that these expectancies operate similarly to sex-related alcohol expectancies. Thus, the extent to which sexuality-specific expectancy domains for alcohol and MJ coincide is unknown. In the future, efforts may need to employ qualitative methods to detail specific sex-related MJ expectancy domains that might not be reflected by the measure used in this study.

Finally, some may question the large *F*-values calculated and presented in our findings. As indicated in the analysis section, the *F*-test is conservative and therefore less likely to find that a variable is significant, albeit as the sample size increases, "the power curves seem to converge to that based on the normal distribution [65]." However, prior to our analysis, to conform to the assumptions regarding that continuous variables in our study had multivariate normal distributions, non-normality was assessed using the Mardia's test for multivariate normality [66]. The resulting multivariate index was not significant providing statistical evidence for a normal distribution.

CONCLUSION

The current findings extend prior research by examining associations of MJ use with HIV/STD risk behavior among adjudicated youth and support prior reports suggesting that MJ use is a likely marker for STI risk practices, particularly in high-risk adolescent populations. The present findings further suggest that associations of MJ use and sexual risk behavior can be moderated by individual difference variables, including MJ expectancies. Although other dispositional factors, including those related to behavioral disinhibition, could also be relevant for characterizing these associations, it is essential that in the future, methodological approaches that account for such confounding influences related to individual difference variables, will be important for addressing the possibility of causal associations of MJ with sexual risk outcomes in future studies.

REFERENCES

1. Risser JM, Risser WL, Gefter LR, Brandstetter DM, Cromwell PF. Implementation of a screening program for chlamydial infection in incarcerated adolescents. Sex Transm Dis 2001;28:43-6.
2. Katz AR, Lee MV, Ohye RG, Effler PV, Johnson EC, Nishi SM. Prevalence of chlamydial and gonorrheal infections among females in a juvenile detention facility, Honolulu, Hawaii. J Community Health 2004;29:265-9.
3. Robertson AA, Thomas CB, St Lawrence JS, Pack R. Predictors of infection with Chlamydia or gonorrhea in incarcerated adolescents. Sex Transm Dis 2005;32:115-22.
4. Malow RM, Dévieux JG, Rosenberg R, Samuels DM, Jean-Gilles MM. Alcohol use severity and HIV sexual risk among juvenile offenders. Subst Use Misuse 2006;41:1769-88.
5. Aalsma MC, Wiehe SE, Blythe MJ, Tong Y, Harezlak J, Rosenman MB. Mental health screening and STI among detained youth. J Community Health 2011;36:300-6.
6. Watson DW, Bisesi L, Tanamly S. Substance use HIV intervention program (SHIP): A school-based indicated prevention model for juvenile offenders in the alternative school setting. J Correct Educ 2004;55:236-59.
7. Kingree JB, Braithwaite R, Woodring T. Unprotected sex as a function of alcohol and marijuana use among adolescent detainees. J Adolesc Health 2000;27:179-85.
8. Kelly PJ, Bair RM, Baillargeon J, German V. Risk behaviors and the prevalence of Chlamydia in a juvenile detention facility. Clin Pediatr (Phila) 2000;39:521-7.
9. Tyler KA, Whitbeck LB, Hoyt DR, Yoder KA. Predictors of self-reported sexually transmitted diseases among homeless and runaway adolescents. J Sex Res 2000;37:369-377.
10. Robillard A, Braithwaite R, Conerly R, Stephens T, Woodring T. Sexual risk behavior among adolescent detainees: Early sexual onset, multiple partners and condom use. Am J Health Stud 2006;20:105-13.
11. Teplin LA, Abram KM, McClelland GM, Dulcan MK, Mericle AA. Psychiatric disorders in youth in juvenile detention. Arch Gen Psychiatry 2002;59:1133-43.
12. Crosby R, Salazar LF, Diclemente RJ. Lack of recent condom use among detained adolescent males: A multilevel investigation. Sex Transm Infect 2004;80:425-9.
13. Harwell TS, Trino R, Rudy B, Yorkman S, Gollub EL. Sexual activity, substance use, and HIV/STD knowledge among detained male adolescents with multiple versus first admissions. Sex Transm Dis 1999;26:265-71.
14. Stephens T, Holliday RC. Predictors of suicide ideation and risk for HIV among juvenile offenders in Georgia. Int J Adolesc Med Health 2014;26:137-43.
15. SAMHSA. Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings. No. NSDUH Series H-44. Bethesda: HHS Publication No. SMA 12-4713; 2012.
16. Braithwaite R, Conerly RC, Robillard AG, Stephens T, Woodring T. Alcohol and other drug use among adolescent detainees. J Subst Use 2003;8:126-31.
17. Buu A, Dipiazza C, Wang J, Puttler LI, Fitzgerald HE, Zucker RA. Parent, family, and neighborhood effects on the development of child substance use and other psychopathology from preschool to the start of adulthood. J Stud Alcohol Drugs 2009;70:489-98.
18. Tucker JS, Pollard MS, de la Haye K, Kennedy DP, Green HD Jr. Neighborhood characteristics and the initiation of marijuana use and binge drinking. Drug Alcohol Depend 2013;128:83-9.
19. Stephens T, Holliday RC, Jarboe J. Self-reported ecstasy (MDMA) use and past occurrence of sexually transmitted infections (STIs) in a cohort juvenile detainees in the USA. J Community Health 2015;40:308-13.
20. Kelly AB, O'Flaherty M, Connor JP, Homel R, Toumbourou JW, Patton GC, *et al*. The influence of parents, siblings and peers on pre- and early-teen smoking: A multilevel model. Drug Alcohol Rev 2011;30:381-7.
21. Kilpatrick DG, Acierno R, Saunders B, Resnick HS, Best CL, Schnurr PP. Risk factors for adolescent substance abuse and dependence: Data from a national sample. J Consult Clin Psychol 2000;68:19-30.
22. Behrendt S, Wittchen HU, Höfler M, Lieb R, Beesdo K. Transitions from first substance use to substance use disorders in adolescence: Is early onset associated with a rapid escalation? Drug Alcohol Depend 2009;99:68-78.

23. Guttmannova K, Hill KG, Bailey JA, Lee JO, Hartigan LA, Hawkins JD, *et al*. Examining explanatory mechanisms of the effects of early alcohol use on young adult alcohol dependence. J Stud Alcohol Drugs 2012;73:379-90.
24. Gordon MS, Kinlock TW, Battjes RJ. Correlates of early substance use and crime among adolescents entering outpatient substance abuse treatment. Am J Drug Alcohol Abuse 2004;30:39-59.
25. Slade EP, Stuart EA, Salkever DS, Karakus M, Green KM, Ialongo N. Impacts of age of onset of substance use disorders on risk of adult incarceration among disadvantaged urban youth: A propensity score matching approach. Drug Alcohol Depend 2008;95:1-13.
26. Miotto P, De Coppi M, Frezza M, Rossi M, Preti A. Social desirability and eating disorders. A community study of an Italian school-aged sample. Acta Psychiatr Scand 2002;105:372-7.
27. Kristiansen CM, Harding CM. The social desirability of preventive health behavior. Public Health Rep 1984;99:384-8.
28. Vernon SW, Abotchie PN, McQueen A, White A, Eberth JM, Coan SP. Is the accuracy of self-reported colorectal cancer screening associated with social desirability? Cancer Epidemiol Biomarkers Prev 2012;21:61-5.
29. Crutzen R, Göritz AS. Social desirability and self-reported health risk behaviors in web-based research: Three longitudinal studies. BMC Public Health 2010;10:720.
30. Newsom JT, Huguet N, McCarthy MJ, Ramage-Morin P, Kaplan MS, Bernier J, *et al*. Health behavior change following chronic illness in middle and later life. J Gerontol B Psychol Sci Soc Sci 2012;67:279-88.
31. Huygen AC, Kuis W, Sinnema G. Psychological, behavioural, and social adjustment in children and adolescents with juvenile chronic arthritis. Ann Rheum Dis 2000;59:276-82.
32. Eisenberg ME, Olson RE, Neumark-Sztainer D, Story M, Bearinger LH. Correlations between family meals and psychosocial well-being among adolescents. Arch Pediatr Adolesc Med 2004;158:792-6.
33. Crowne DP, Marlowe D. A new scale of social desirability independent of psychopathology. J Consult Psychol 1960;24:349-54.
34. Reynolds WM. Development of reliable and valid short forms of the marlowe-crowne social desirability scale. J Clin Psychiatry 1982;38:119-25.
35. Teplin LA, Mericle AA, McClelland GM, Abram KM. HIV and AIDS risk behaviors in juvenile detainees: Implications for public health policy. Am J Public Health 2003;93:906-12.
36. Belenko S, Logan TK. Delivering more effective treatment to adolescents: Improving the juvenile drug court model. J Subst Abuse Treat 2003;25:189-211.
37. Dermen KH, Cooper ML. Sex-related alcohol expectancies among adolescents: I. scale development. Psychol Addict Behav 1994;8:152-60.
38. Teplin LA, Elkington KS, McClelland GM, Abram KM, Mericle AA, Washburn JJ. Major mental disorders, substance use disorders, comorbidity, and HIV-AIDS risk behaviors in juvenile detainees. Psychiatr Serv 2005;56:823-8.
39. Tarter RE, Kirisci L, Vanyukov M, Cornelius J, Pajer K, Shoal GD, *et al*. Predicting adolescent violence: Impact of family history, substance use, psychiatric history, and social adjustment. Am J Psychiatry 2002;159:1541-7.
40. Le'Roy ER, Vera EM. Culturally relevant prevention: The scientific and practical considerations of community-based programs. Couns Psychol 2007;35:763-78.
41. Cooper LA, Hill MN, Powe NR. Designing and evaluating interventions to eliminate racial and ethnic disparities in health care. J Gen Intern Med 2002;17:477-86.
42. Jackson KF. Building cultural competence: A systematic evaluation of the effectiveness of culturally sensitive interventions with ethnic minority youth. Child Youth Serv Rev 2009;31:1192-8.
43. Snyder HN, Sickmund M. Washington, DC: U.S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention; 2006. Juvenile Offenders and Victims: 2006 National Report.
44. Stephens TT, Braithwaite R, Robillard A, Finnie R, Colbert SA. Community-based approach to eliminating racial and health disparities among incarcerated populations: The HIV example for inmates returning to the community. Health Promot Pract 2002;3:255-63.
45. Level LD, Chamberlain P. Association with delinquent peers: Intervention effects for youth in the juvenile justice system. J Abnorm Child Psychol 2005;33:339-47.
46. Centers for Disease Control and Prevention. Chlamydia Prevalence Monitoring Project Annual Report 2005. Sexually Transmitted Disease Surveillance 2005 Supplement. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2006.
47. Belenko S, Sprott JB, Petersen CC. Drug and alcohol involvement among minority and female juvenile offenders: Treatment and policy issues. Crim Justice Policy Rev 2004;15:3-36.
48. Crosby RA, DiClemente RJ, Wingood GM, Rose E, Levine D. Adjudication history and African American adolescents' risk for acquiring sexually transmitted diseases: An exploratory analysis. Sex Transm Dis 2003;30:634-8.
49. Stephens TT, Ogbuawa N, Braithwaite R. Demographic profile of inhalant, amphetamine, ecstasy, and heroin use among male inmates in the U.S. J Mens Health Gend 2007;4:74-80.
50. Stephens TT, Braithwaite R, Sifunda S, Bhengu S, Reddy P. Condom use beliefs among South African inmates who smoke marijuana. Addict Disord Their Treat 2007;6:197-202.
51. Kingree JB, Phan DL. Marijuana use and HIV risk among adolescent offenders: The moderating effect of age. J Subst Abuse 2001;13:59-71.
52. Chen P, Jacobson KC. Developmental trajectories of substance use from early adolescence to young adulthood: Gender and racial/ethnic differences. J Adolesc Health 2012;50:154-63.
53. Gessa GL, Melis M, Muntoni AL, Diana M. Cannabinoids activate mesolimbic dopamine neurons by an action on cannabinoid CB1 receptors. Eur J Pharmacol 1998;341:39-44.
54. French ED. delta9-Tetrahydrocannabinol excites rat VTA dopamine neurons through activation of cannabinoid CB1 but not opioid receptors. Neurosci Lett 1997;226:159-62.
55. Volkow ND, Wang GJ, Fowler JS, Tomasi D. Addiction circuitry in the human brain. Annu Rev Pharmacol Toxicol 2012;52:321-36.
56. Wise RA, Rompre PP. Brain dopamine and reward. Annu Rev Psychol 1989;40:191-225.
57. Volkow ND, Wang GJ, Fowler JS, Logan J, Gatley SJ, Wong C, *et al*. Reinforcing effects of psychostimulants in humans are associated with increases in brain dopamine and occupancy of D(2) receptors. J Pharmacol Exp Ther 1999;291:409-15.
58. Bossong MG, van Berckel BN, Boellaard R, Zuurman L, Schuit RC, Windhorst AD, *et al*. Delta 9-tetrahydrocannabinol induces dopamine release in the human striatum. Neuropsychopharmacology 2009;34:759-66.
59. Castelli MP, Fadda P, Casu A, Spano MS, Casti A, Fratta W, *et al*. Male and female rats differ in brain cannabinoid CB1 receptor density and function and in behavioural traits predisposing to drug addiction: Effect of ovarian hormones. Curr Pharm Des 2014;20:2100-13.
60. Mechoulam R, Parker LA. The endocannabinoid system and the brain. Annu Rev Psychol 2013;64:21-47.
61. Robertson AA, Dill PL, Husain J, Undesser C. Prevalence of mental illness and substance abuse disorders among incarcerated juvenile offenders in Mississippi. Child Psychiatry Hum Dev 2004;35:55-74.
62. Pedlow CT, Carey MP. Developmentally appropriate sexual risk reduction interventions for adolescents: Rationale, review of interventions, and recommendations for research and practice. Ann Behav Med 2004;27:172-84.
63. Podsakoff PM, Organ DW. Self-reports in organizational research: Problems and prospects. J Manage 1986;12:531-44.
64. Fenton KA, Johnson AM, McManus S, Erens B. Measuring sexual behaviour: Methodological challenges in survey research. Sex Transm Infect 2001;77:84-92.
65. Tiku ML. Power function of the F-Test under non-normal situations. J Am Statistical Assoc 1971;66:913-6.
66. Mardia KV. Measures of multivariate skewness and kurtosis with applications. Biometrika 1970;57:519-30.

Source of Support: Nil, Conflict of Interest: None declared.