

Patterns and correlates of illicit drug selling among youth in the USA

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Purpose: Despite the high rates of drug selling among youth in juvenile justice and youth residing in disadvantage neighborhoods, relatively little is known about the patterns of illicit drug selling among youth in the general population.

Methods: Using the public-use data file from the adolescent sample (N = 17 842) in the 2008 National Survey on Drug Use and Health (NSDUH), this study employed multiple logistic regression to compare the behavioral, parental involvement, and prevention experiences of youth who sold and did not sell illicit drugs in the past year.

Results: Findings from a series of logistic regression models indicated youth who sold drugs were far more likely to use a wide variety of drugs and engage in delinquent acts. Drug-selling youth were significantly less likely to report having a parent involved in their life and have someone to talk to about serious problems but were more likely to report exposure to drug prevention programming.

Conclusion: Selling of drugs by youth appears to be a byproduct of substance abuse and deviance proneness, and the prevention programs these youth experience are likely a result of mandated exposure derived from contact with the criminal justice system. Assuming no major drug supply side reductions, policies, and practices associated with increasing drug abuse treatment, parental involvement and supervision, and school engagement are suggested.

Keywords: drug distribution, prevention, adolescent risk, youth experiences, parental involvement

Introduction

The participation of youth in illicit drug selling is a serious public health concern. Research suggests that adolescent participation in drug dealing has increased over the last several decades.¹ Prior studies have found correlations between illicit drug selling and high levels of substance use,^{2,3} violence,^{4,5} gang participation,⁶ and other forms of delinquency.^{4,7,8} As such, large numbers of youth who come in contact with the juvenile justice system have a history of illicit drug selling.^{1,8-10}

Research on adolescent drug selling in urban, disadvantaged areas, including youth living in public housing, reveals that between 6% and 20% had sold drugs at some point.^{2-4,7,11,12} The concern with respect to this relatively high prevalence is fueled by the combustible relationship between drug selling and a range of problematic behaviors. For example, studies have found an association between drug dealing and cigarette, alcohol, and illicit drug use.^{2,3,5,12}

A number of studies have also found strong associations between drug selling and participation in violence and delinquency.^{5,7,9,11} In an effort to clarify the

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relations between drug selling and drug use, Altschuler and Brounstein⁷ compared the following four groups from their sample of young people in schools and community centers: (1) drug users and sellers, (2) drug sellers who do not use, (3) drug users who do not sell, and (4) youth who take part in neither activity. Results showed that youth in the drug users and sellers group were the most delinquent, and drug sellers that did not use drugs were more delinquent than the other two groups. Fagan and Chin⁵ found that levels of violence were intimately tied to the type of drug being sold. Of course, urban rates of violence in the 1980s and early 1990s were directly tied to the crack cocaine market. The dynamic relationship between selling illicit drugs (especially crack cocaine) and handguns as a driver of violence is consistent with the drug–gun diffusion hypothesis.¹³ Although the directionality with respect to causation among these factors is not firmly established, and is likely to be complex and conditional, drug selling is part and parcel of a nexus of dangerous and costly behaviors. In a way, drug selling serves as a sort of vector for a wide swath of risky behaviors.

Current study purpose

Despite the high rates of drug selling among youth in juvenile justice and youth residing in disadvantage neighborhoods, relatively little is known about the patterns of illicit drug selling in the general population. In particular, little is known about how youth who sell drugs differ from those who do not sell drugs. Knowledge of these patterns can provide a deeper understanding of the association between illicit drug selling and the extent to which these youth are embedded in substance abuse, are involved with their families, and have encounters with prevention programming. The inclusion of family variables is important because bonds and connections to adults have shown to be a form of social control via behavioral monitoring, and breakdowns increase the likelihood of problem behavior such as drug selling.^{14,15} In the present study we sought to extend previous research by answering several questions. For example, how much more likely are youth who sell drugs likely to use drugs compared with youth who do not sell drugs? To what extent are youth who sell drugs likely to have a parent involved in their lives and in what aspects? Do youth who sell drugs encounter or participate in youth activities or prevention-related programming? National studies have not established the extent to which these factors are correlated with drug selling among youth. This is important to do so, because developing prevention or policy efforts without knowing the magnitude of these correlates in national samples render these efforts less efficient. The goal of this

study is to answer the aforementioned research questions and contribute to the empirical foundation that informs prevention strategies aimed toward reducing drug selling among adolescents in the USA.

Methods

Sample and procedures

This study is based on data from the NSDUH.¹⁶ NSDUH is designed to provide population estimates of substance use and health-related behaviors in the US general population. It utilizes multistage area probability sampling methods to select a representative sample of the US civilian, noninstitutionalized population aged 12 years or older for participation in the study. Multistage sampling designs are commonly used designs when attempting to provide nationally representative estimates. This is because interviewing all participants is not feasible, so larger units are the first stage selected from, with subsequent levels of strata partitioned until individuals from households are selected. With respect to the NSDUH, all 50 states and the District of Columbia were employed. Within this state-level stage one sample, secondary sampling units (stage two) were based on regions within large states composed of 48 regions and remaining states parsed in 12 regions. Census tracts within these secondary sampling regions were then used from which to select household or dwelling units and individuals. Study participants include household residents (residents of shelters, rooming houses, and group homes), residents of Alaska and Hawaii, and civilians residing on military bases. To improve the precision of drug-use estimates for subgroups, adolescents aged 12–17 years and young adults aged 18–25 years were oversampled.

NSDUH study participants were interviewed in private at their places of residence. Potential participants were assured that their names would not be recorded and that their responses would be kept strictly confidential. Participants were paid US\$30 for their participation. All field interviewers signed a confidentiality agreement, and the procedures and protections were carefully explained to potential participants in the informed consent protocol. The NSDUH interview utilizes a computer-assisted interviewing (CAI) methodology to increase the likelihood of valid respondent reports of illicit drug-use behaviors.¹⁶ The CAI methodology includes a combination of computer-assisted personal interviewing (CAPI) and audio computer-assisted self-interviewing (ACASI) methodologies. ACASI is designed to provide the respondent with a highly private and confidential means of responding to questions and is used for questions of a sensitive nature (eg, substance use). Respondents read questions

on the computer screen or questions were read to respondents through headphones, and then respondents entered their responses directly into the computer.

A total of 68 736 respondents aged 12 years or older completed the 2008 survey. Weighted response rates were 89% for household screening and 74.4% for interviewing.¹⁶ Each independent, cross-sectional NSDUH sample was considered representative of the US general population aged 12 years or older. NSDUH design and data collection procedures have been reported in detail elsewhere.¹⁶ The current study restricted analyses to the adolescents aged 12–17 years ($N = 17\,842$).

Measures

Drug selling

Adolescents who sold illicit drugs ($N = 599$) were identified based on whether they responded affirmatively to the question “During the past 12 months, how many times have you sold illegal drugs?” Drug sellers were coded as 1 (yes) or 0 (no).

Behavioral variables

A host of risk variables including substance use and delinquent behaviors was used. Substance use variables assessed were self-reported past-year use of alcohol and illicit drugs (marijuana, inhalants, hallucinogens, cocaine/crack cocaine, heroin). These were dichotomously measured as use and nonuse. Delinquent variables were self-reported as: past-year stealing an item worth 50 dollars or more, attacking someone with the intent to injure, arguing or fighting with a parent, serious fighting at school or work, and carrying a handgun. These were also measured dichotomously (ie, yes or no). Two dichotomously coded items were used to assess risk propensity including: “How often do you get a real kick out of doing things that are a little dangerous?” and “How often do you like to test yourself by doing something a little risky?”

Sociodemographic and mental health covariates

The following demographic variables were used: age, gender, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and other [American Indian or Alaska Native, Asian, other Pacific Islander or Native Hawaiian, and persons reporting more than one race]), school status (in school versus not in school), having a father in the home or not, ever jailed or incarcerated, total annual family income (less than US\$20 000, US\$20 000–\$49 999, US\$50 000–\$74 999, and US\$75 000 or more), and metropolitan population density (nonmetropolitan

area, large metropolitan area ≥ 1 million, small metropolitan area < 1 million). Family income was ascertained by asking respondents: “Of these income groups, which category best represents your total combined family income during the previous calendar year?” Proxy responses were accepted from a household member identified as being better able to give the correct information about family income for adolescents who were unable to respond to the income question. Additionally, we also examined lifetime history of depression and anxiety. This was based on whether the respondents were told by a doctor or other medical professional if they had either of these disorders.

Parental involvement covariates

Due to the importance of monitoring, supervision, and connectedness for youth, several family involvement variables were included. Seven items (0 = no, 1 = yes) were used to assess various forms of parental involvement. Sample items included: “During the past 12 months, how often did your parents provide help with your homework when you needed it?”; “During the past 12 months, how often did your parents limit the amount of time you went out with friends on school nights?”; and “During the past 12 months, how often did your parents tell you they were proud of you for something you had done?”

Youth experience covariates

We identified a number of variables that reflected contact with prosocial activities and formal programming. Seven items (0 = no, 1 = yes) were used to assess experiences that youth had with prevention programming both in and out of school. Sample items included: “During the past 12 months, have you participated in a violence prevention program where you learn ways to avoid fights and control anger?”; “During the past 12 months, have you participated in an alcohol, tobacco, or drug prevention program outside of school where you learn about the dangers of using and how to resist using, alcohol, tobacco, or drugs?”; and “During the past 12 months, in how many different kinds of school-based activities, such as team sports, cheerleading, choir, band, student government, or clubs, have you participated?”

Statistical analysis

Weighted prevalence estimates and standard errors were computed using Stata 10SE (StataCorp LP, College Station, TX). This system implements a Taylor series linearization to adjust standard errors of estimates for complex survey sampling design effects including clustered data. A series of multiple

logistic regression analyses was conducted to first assess the associations between demographic and behavioral variables and drug selling. Next, we examined the associations between prior youth experiences, including contact with prevention programming, and illicit drug selling. Finally, we assessed the correlates of indicators of parental supervision and involvement on drug selling. Final adjusted models controlled for the effects of age, race/ethnicity, gender, family income, lifetime anxiety and depression, and lifetime drug use. Adjusted odds ratios (AORs) and 95% confidence intervals (CIs) are presented to reflect association strength. AORs were considered statistically significant only if associated confidence intervals did not include the value 1.0.

Results

Sociodemographic and behavioral correlates of drug selling

Table 1 shows the sociodemographic and behavioral characteristics of youth who have and have not reported selling drugs in the past year. Adolescents reporting a history of drug selling were more likely to be male (odds ratio [OR] = 2.23, 95% CI = 1.72–2.89), not have a father in the home (OR = 1.49, 95% CI = 1.15–1.92), and to have been incarcerated (OR = 5.61, 95% CI = 4.22–7.45). There were no significant differences found with respect to race/ethnicity and school dropout.

With respect to behavioral correlates, numerous variables were found to have large effects. Youth who reported carrying a handgun (OR = 16.11, 95% CI = 11.85–21.90), having stolen items worth US\$50 or more (OR = 17.40, 95% CI = 13.13–23.06), attacking someone (OR = 8.24, 95% CI = 6.22–10.92), arguing/fighting with a parent (OR = 2.81, 95% CI = 2.18–3.62), and serious fighting at school (OR = 4.11, 95% CI = 3.18–5.30) had increased odds of selling drugs. Lifetime use of illicit substances was also strongly associated with drug selling, including marijuana (OR = 31.99, 95% CI = 22.21–46.07), ecstasy (OR = 20.32, 95% CI = 14.05–29.39), hallucinogens (OR = 26.96, 95% CI = 19.44–37.40), cocaine/crack cocaine (OR = 31.99, 95% CI = 22.21–46.07), and heroin (OR = 19.38, 95% CI = 8.39–44.24). Age of first drug use (marijuana) also was associated with increased probability of drug selling. Two items reflecting risk propensity (sometimes/always), including “getting a kick out of doing things” (OR = 11.26, 95% CI = 7.57–16.75) and “liking to do risky things” (OR = 7.88, 95% CI = 5.48–11.35) increased odds of

selling drugs. Finally, lifetime depression (OR = 3.67, 95% CI = 2.45–5.49), but not anxiety, incremented the probability of selling drugs.

To what extent are youth who sell illicit drugs less likely to have a parent involved in their lives and in what aspects?

Table 2 compares the prevalence of various forms of parental involvement and supervision for adolescents reporting and not reporting illicit drug selling. Results of AORs indicate that most forms of parental involvement and supervision were uniformly and significantly associated with a reduced likelihood of selling drugs. The strongest correlates were found for adolescents who reported that parents telling them they had done a good job in the past year (OR = 0.50, 95% CI = 0.37–0.67), parents checking to see if they had done their homework in the past year (OR = 0.55, 95% CI = 0.42–0.73), and parents mentioning they were proud of them (OR = 0.58, 95% CI = 0.43–0.78). Parents helping with homework and limiting the amount of television and time out on school nights also were significantly associated with reduced drug selling. Having a parent who talked with youth about the danger of tobacco/alcohol/drugs was not significantly associated with reduced likelihood of selling drugs.

Do youth who sell drugs participate in drug and/or violence prevention programs?

Table 3 examines various prevention experiences among adolescents reporting past-year drug selling compared with youth who did not report selling drugs. AORs reveal that adolescents who sell drugs were less likely to have someone to talk with about serious problems (OR = 0.41, 95% CI = 0.23–0.71). However, adolescents who reported selling drugs were more likely to participate in drug prevention programming outside of school (OR = 1.52, 95% CI = 1.02–2.26) and a program to help reduce their drug abuse (OR = 2.41, 95% CI = 1.52–3.82).

Discussion

In the present study we sought to elucidate the patterns and correlates of drug selling and answer three key research questions. The first question, with respect to substance use among drug-selling youth, reveals that these youth were far more likely to use a wide variety of drugs than non-drug-selling youth. Although not surprising,

Table I Demographic, behavioral, and psychological associations with selling drugs

	Non-drug sellers		Sold drugs		Unadjusted OR		Adjusted OR ^a	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex								
Male	96.04	(95.50–96.52)	3.96	(3.48–4.50)	2.07	(1.59–2.69)	2.23	(1.72–2.89) ^b
Female	98.05	(97.57–98.44)	1.95	(1.56–2.43)	1.00		1.00	
Race/ethnicity								
African-American	96.43	(95.32–97.29)	3.57	(2.71–4.68)	1.19	(0.87–1.64)	1.36	(0.98–1.89)
Hispanic	97.52	(96.66–98.16)	2.48	(1.84–3.34)	0.82	(0.59–1.15)	0.89	(0.61–1.29)
Other	97.20	(95.06–98.43)	2.80	(1.57–4.94)	0.93	(0.51–1.71)	1.01	(0.54–1.90)
White	97.00	(96.56–97.38)	3.00	(2.62–3.44)	1.00		1.00	
In school versus not in school								
Yes	97.76	(96.44–98.60)	2.24	(1.40–3.56)	0.73	(0.45–1.19)	0.68	(0.38–1.20)
No	96.96	(96.59–97.29)	3.04	(2.71–3.41)	1.00		1.00	
Father not in home								
Yes	96.13	(95.34–96.78)	3.87	(3.22–4.66)	1.47	(1.16–1.87)	1.49	(1.15–1.92) ^b
No	97.34	(96.94–97.69)	2.66	(2.31–3.06)	1.00		1.00	
Ever incarcerated								
Yes	87.00	(84.27–89.32)	13.00	(86.77–91.58)	6.26	(4.82–8.14)	5.61	(4.22–7.45) ^b
No	97.67	(97.33–97.97)	2.33	(97.02–97.67)	1.00		1.00	
Carried a handgun								
Yes	71.59	(66.18–76.44)	28.41	(23.56–33.82)	17.90	(13.44–23.85)	16.11	(11.85–21.90) ^b
No	97.83	(97.53–98.10)	2.17	(1.90–2.47)	1.00		1.00	
Stole >US\$50								
Yes	73.17	(68.86–77.08)	26.83	(22.92–31.14)	20.00	(15.44–25.90)	17.40	(13.13–23.06) ^b
No	98.20	(97.91–98.45)	1.80	(1.55–2.09)	1.00		1.00	
Attacked with intent to harm								
Yes	84.17	(81.23–86.73)	15.83	(13.27–18.77)	9.28	(7.21–11.93)	8.24	(6.22–10.92) ^b
No	98.01	(97.71–98.28)	1.99	(1.72–2.29)	1.00		1.00	
Argued/fought with one parent								
Yes	94.54	(93.52–95.41)	5.46	(4.59–6.48)	2.51	(1.98–3.18)	2.81	(2.18–3.62) ^b
No	97.75	(97.40–98.06)	2.25	(1.94–2.60)	1.00		1.00	
Serious fight at school/work								
Yes	92.62	(91.42–93.67)	7.38	(6.33–8.58)	4.36	(3.45–5.52)	4.11	(3.18–5.30) ^b
No	98.21	(97.89–98.48)	1.79	(1.52–2.11)	1.00		1.00	
Lifetime ecstasy use								
Yes	68.38	(61.78–74.31)	31.62	(25.69–38.22)	19.17	(13.93–26.39)	20.32	(14.05–29.39) ^b
No	97.65	(97.32–97.93)	2.35	(2.07–2.68)	1.00		1.00	
Lifetime hallucinogen use								
Yes	62.32	(56.29–68.00)	37.68	(32.00–43.71)	26.99	(20.26–35.97)	26.96	(19.44–37.40) ^b
No	97.81	(97.49–98.09)	2.19	(1.91–2.51)	1.00		1.00	
Lifetime cocaine or crack use								
Yes	58.33	(51.16–65.17)	41.67	(34.83–48.84)	30.53	(22.17–42.04)	31.99	(22.21–46.07) ^b
No	97.71	(97.39–98.00)	2.29	(2.00–2.61)	1.00		1.00	
Lifetime marijuana								
Yes	83.62	(81.74–85.34)	16.38	(14.66–18.26)	55.41	(37.30–82.32)	57.05	(37.41–87.00) ^b
No	99.65	(99.49–99.76)	0.35	(0.24–0.51)	1.00		1.00	
Age of first use of marijuana								
<14 years	79.91	(77.25–82.32)	20.09	(17.68–22.75)	2.11	(1.58–2.81)	2.16	(1.62–2.90) ^b
15–17 years	89.34	(86.82–91.42)	10.66	(8.58–13.18)	1.00		1.00	
Lifetime heroin use								
Yes	55.47	(35.09–74.16)	44.53	(25.84–64.91)	27.18	(11.70–63.13)	19.38	(8.39–44.24) ^b
No	97.13	(96.78–97.44)	2.87	(2.56–3.22)	1.00		1.00	

(Continued)

Table 1 (continued)

	Non-drug sellers		Sold drugs		Unadjusted OR		Adjusted OR ^a	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Lifetime depression								
Yes	91.37	(88.02–93.85)	8.63	(6.15–11.98)	3.46	(2.35–5.09)	3.67	(2.45–5.49) ^b
No	97.34	(96.99–97.65)	2.66	(2.35–3.01)	1.00		1.00	
Lifetime anxiety								
Yes	92.49	(87.52–95.58)	7.51	(4.42–12.48)	2.80	(0.58–4.99)	1.60	(0.87–2.95)
No	97.19	(96.83–97.50)	2.81	(2.50–3.17)	1.00		1.00	
Get a kick out of doing dangerous things								
Sometimes/always	94.11	(93.31–94.81)	5.89	(5.19–6.69)	10.97	(7.58–15.88)	11.26	(7.57–16.75) ^b
Seldom	98.01	(97.38–98.50)	1.99	(1.50–2.62)	3.55	(2.27–5.55)	3.80	(2.37–6.08) ^b
Never	99.43	(99.20–99.60)	0.57	(0.40–0.80)	1.00		1.00	
Like to do risky things								
Sometimes/always	94.10	(93.26–94.85)	5.90	(5.15–6.74)	8.90	(6.29–12.59)	7.88	(5.48–11.35) ^b
Seldom	97.56	(96.91–98.08)	2.44	(1.92–3.09)	3.55	(2.38–5.29)	3.50	(2.29–5.34) ^b
Never	99.30	(99.04–99.49)	0.70	(0.51–0.96)	1.00		1.00	

Notes: ^aAdjusted for age, sex, race, family income, lifetime depression, lifetime anxiety; ^bstatistically significant.

Abbreviations: CI, confidence interval; OR, odds ratio.

these associations were so strong that selling drugs can be regarded as part and parcel of substance abuse. Youth who reported drug use in the past year were also at increased odds of being involved in a wide swath of delinquent behaviors and have a history of incarceration.

The second research question, pertaining to family involvement and supervision, showed a strong pattern of inverse correlation. These associations were robust and uniform.

Third, and perhaps most interesting, are the study results related to exposure to prevention programming. Drug-selling youth were substantially less likely to report having someone in their lives to talk to about serious problems. However, drug-selling youth were more likely to have participated in drug prevention programming outside of school and a program to help with drug abuse. Although a seemingly paradoxical finding, it is more likely that youth who have

Table 2 Associations between parental involvement and drug selling among respondents 12–17 years of age

	Non-drug sellers		Sold drugs		Unadjusted OR		Adjusted OR ^a	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Talked with parent about danger of tobacco/alcohol/drug								
Yes	97.16	(96.68–97.57)	2.84	(2.43–3.32)	0.89	(0.70–1.12)	0.96	(0.74–1.26)
No	96.81	(96.25–97.29)	3.19	(2.71–3.75)	1.00		1.00	
Parents check if homework done in past year								
Yes	97.80	(97.43–98.12)	2.20	(1.88–2.57)	0.33	(0.26–0.43)	0.55	(0.42–0.73) ^b
No	93.70	(92.54–94.69)	6.30	(5.31–7.46)	1.00		1.00	
Parents help with homework in past year								
Yes	97.65	(97.26–97.98)	2.35	(2.02–2.74)	0.39	(0.30–0.49)	0.66	(0.50–0.86) ^b
No	94.15	(93.03–95.09)	5.85	(4.91–6.97)	1.00		1.00	
Parents limit amount of television in past year								
Yes	98.44	(98.00–98.78)	1.56	(1.22–2.00)	0.39	(0.29–0.52)	0.70	(0.52–0.96) ^b
No	96.08	(95.55–96.54)	3.92	(3.46–4.45)	1.00		1.00	
Parents limit time out on school night in past year								
Yes	97.53	(97.14–97.87)	2.47	(2.13–2.86)	0.54	(0.42–0.69)	0.72	(0.55–0.95) ^b
No	95.51	(94.61–96.27)	4.49	(3.73–5.39)	1.00		1.00	
Parents tell youth had done good job in past year								
Yes	97.64	(97.31–97.93)	2.36	(2.07–2.69)	0.33	(0.25–0.43)	0.50	(0.37–0.67) ^b
No	93.16	(91.58–94.46)	6.84	(5.54–8.42)	1.00		1.00	
Parents tell youth proud of things done in past year								
Yes	97.58	(97.23–97.88)	2.42	(2.12–2.77)	0.38	(0.29–0.49)	0.58	(0.43–0.78) ^b
No	93.80	(92.37–94.97)	6.20	(5.03–7.63)	1.00		1.00	

Notes: ^aAdjusted for age, sex, race, family income, lifetime depression, lifetime anxiety, and lifetime drug use; ^bstatistically significant.

Abbreviations: CI, confidence interval; OR, odds ratio.

Table 3 Associations between youth experiences and drug selling among respondents 12–17 years of age

	Non-drug sellers		Sold drugs		Unadjusted OR		Adjusted OR ^a	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Who youth talk with about serious problems								
Someone	97.19	(96.85–97.50)	2.81	(2.51–3.15)	0.34	(0.21–0.54)	0.41	(0.23–0.71) ^b
No one	92.07	(87.97–94.85)	7.93	(5.15–12.03)	1.00		1.00	
Participated in PRBSLV/commSkill/self-esteem group								
Yes	97.93	(97.34–98.39)	2.07	(1.61–2.66)	0.62	(0.47–0.83)	0.78	(0.55–1.10)
No	96.73	(96.29–97.11)	3.27	(2.89–3.71)	1.00		1.00	
Participated in violence prevention program								
Yes	96.96	(96.00–97.70)	3.04	(2.30–4.00)	1.03	(0.75–1.40)	1.25	(0.86–1.80)
No	97.04	(96.65–97.38)	2.96	(2.62–3.35)	1.00		1.00	
Participated in drug prevention program outside school								
Yes	95.94	(94.34–97.10)	4.06	(2.90–5.66)	1.46	(1.01–2.11)	1.52	(1.02–2.26) ^b
No	97.17	(96.82–97.49)	2.83	(2.51–3.18)	1.00		1.00	
Participated in program to help drug abuse								
Yes	92.79	(90.00–94.84)	7.21	(5.16–10.00)	2.73	(1.87–3.98)	2.41	(1.52–3.82) ^b
No	97.23	(96.87–97.54)	2.77	(2.46–3.13)	1.00		1.00	
Participated in youth activities								
Yes	97.34	(96.96–97.67)	2.66	(2.33–3.04)	0.56	(0.43–0.72)	0.84	(0.63–1.12)
No	95.31	(94.22–96.21)	4.69	(3.79–5.78)	1.00		1.00	
Seen drug prevention messages outside school								
Yes	97.09	(96.69–97.45)	2.91	(2.55–3.31)	0.90	(0.69–1.18)	0.93	(0.68–1.29)
No	96.79	(95.98–97.45)	3.21	(2.55–4.02)	1.00		1.00	
Any drug education in school								
Yes	97.31	(96.90–97.66)	2.69	(2.34–3.10)	0.65	(0.50–0.84)	0.88	(0.66–1.16)
No	95.93	(95.01–96.68)	4.07	(3.32–4.99)	1.00		1.00	

Notes: ^aAdjusted for age, sex, race, family income, lifetime depression, lifetime anxiety, and lifetime drug use; ^bstatistically significant.

Abbreviations: CI, confidence interval; OR, odds ratio; PRBSLV/commSkill, problem solving/communication.

used and sold drugs, have been in trouble, and have had contact with the criminal justice system have been exposed to these sorts of mandated programming. This is further corroborated by the finding that drug-selling youth were also less likely to have been exposed to drug education while in school. However, the duration and quality of the role of these types of youth experiences is unknown and requires further research. Although little research has accrued on court-mandated interventions for youth, initial research indicates that the use of evidence-based treatments in these contexts can reduce substance-related problems.¹⁷ Several quantitative reviews have shown that interventions such as multidimensional family therapy can effectively reduce drug use in court-referred youth.^{18,19}

Although findings from the present study are nationally representative, they do converge with results from previous nonrepresentative studies with respect to drug selling in relation to alcohol and illicit drug use,^{3–5,12} and correlations between drug selling and participation in violence and delinquency.^{7,9,11} While the present study found powerful associations between drug use and drug selling there is no data in the NSDUH available to disentangle this relationship. However, recent research by Shook et al²⁰

found that 69% of the youthful offenders who sold drugs reported that they kept more than half of the drugs they purchased for their own use and 57% reported that they worked alone in their drug-selling activities. Importantly, findings from this study suggest that many of these youth who sell drugs are not merely engaged in an economic activity, or part of a broader drug trafficking enterprise, but their engagement in drug selling is tied, at least in part, to their drug use.

Although youth who engage in a wide variety of problem behaviors such as drug selling are in need of positive redirection, this task is not as simple as surrounding them in extant services. These youth typically present with difficult temperaments, impulsivity, may have parents who are themselves antisocial, and reside in difficult surroundings where desperation and urgency are common. Although findings from this study reaffirm that effective parenting, communication, and parental supervision can attenuate the relationships among drug selling, drug usage, and related problem behaviors, implementing these practices is no small task. Many of these youth are in families experiencing daily struggles related to employment, but also the parents themselves may abuse substances. Also, parenting a child who is prone to

risk, rejected by prosocial peers, and developing deviant peer affiliations is not easy.

The sheer volume of illicit substances in circulation tempers optimism regarding the reduction in drug selling by youth. Absent major supply-side reductions, there are still reasonable strategies that potentially may be helpful. In particular, treatment for adolescent substance abusers appears sensible given the high rates of drug misuse among youth who sell drugs.²¹ Certainly, this assumes a willingness to enter treatment or that coerced treatment would be effective. Finding innovative ways to target youth, who are the most severe substance abusers and the most violent, is important.

Study limitations

Results from the current study should be interpreted within the context of several limitations. First, the assessment of selling drugs was based on one item and did not capture the frequency and extent of drug selling or the specific reasons for doing so. Although it was a single item, convergent relations with substance use and risk-taking supported its validity. Second, causal determinations cannot be made with respect to the associations identified due to the cross-sectional study design. Another limitation is that the NSDUH relies on respondent recall and is therefore subject to the usual under- or over-reporting inherent in such assessments. Although the NSDUH is a nationally representative sample and its scope is perhaps unsurpassed, the survey does not include important contextual, situational, and precipitating information, which is necessary for a fuller illumination of the drug-selling phenomenon.

Despite these limitations, results do provide useful insights into the relations among drug selling, behavioral risk, parental involvement, and prevention programming among youth in the USA.

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This study used publicly available data and followed all necessary precautions with respect to human subjects and Institutional Review Board approval.

Disclosure

The authors disclose no conflicts of interest in this work.

References

1. Little M, Steinberg L. Psychosocial correlates of adolescent drug dealing in the inner city. *J Res Crime Delinquency*. 2006;43:357–386.
2. Li X, Stanton B, Feigelman S, Black MM, Romer D. Drug trafficking and drug use among urban African American early adolescents. *J Early Adol*. 1994;14(4):491–508.
3. McCurley C, Snyder HN. Co-occurrence of substance use behaviors in youth. *Juvenile Justice Bulletin*. Washington, DC: US Department of Justice, Office of Juvenile Justice and Delinquency Prevention; 2008.
4. Li X, Stanton B, Feigelman S. Exposure to drug trafficking among urban low-income African American children and adolescents. *Arch Ped Adol Med*. 1999;153:161–168.
5. Fagan J, Chin K. Violence as regulation and social control in the distribution of crack. In: *Drugs and Violence: Causes, Correlates, and Consequences*. Rockville, MD: National Institute of Drug Abuse Research, US Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse and Mental Health Administration; 1990; 103:112–135.
6. Moore J. Gangs, drugs, and violence. In: *Drugs and Violence: Causes, Correlates, and Consequences*. Rockville, MD: National Institute of Drug Abuse Research, US Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse and Mental Health Administration; 1990.
7. Altschuler DM, Brounstein PJ. Patterns of drug use, drug trafficking, and other delinquency among inner-city adolescent males in Washington, D.C. *Criminology*. 1991;29(4):589–622.
8. Dembo R, Williams L, Werner W, et al. The relationship between cocaine use, drug sales, and other delinquency among a cohort of high-risk youths over time. In: *Drugs and Violence: Causes, Correlates, and Consequences*. Rockville, MD: National Institute of Drug Abuse Research, US Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse and Mental Health Administration; 1990; 103:112–135.
9. Centers NL, Weist MD. Inner city youth and drug dealing: a review of the problem. *J Youth Adol*. 1998;27(3):395–411.
10. Inciardi JA, Surratt HL, Kurtz SP, Cicero TJ. Mechanisms of prescription drug diversion among drug-involved club- and street-based populations. *Pain Med*. 2007;8(2):171–183.
11. Li X, Feigelman S. Recent and intended drug trafficking among male and female urban African-American early adolescents. *Pediatrics*. 1994; 93(6):1044–1049.
12. Black MM, Ricardo IB. Drug use, drug trafficking, and weapon carrying among low-income, African-American, early adolescent boys. *Pediatrics*. 1994;93(6):1065–1072.
13. Blumstein A, Wallman J, editors. *The Crime Drop in America*. Cambridge, MA: Cambridge University Press; 2000.
14. Kuntsche EN, Kuendig H. What is worse? A hierarchy of family-related risk factors predicting alcohol use in adolescence. *Sub Use Misuse*. 2006;41:71–86.
15. Vakalahi HF. Adolescent substance use and family-based risk and protective factors: a literature review. *J Drug Edu*. 2001;31:29–46.
16. Substance Abuse and Mental Health Services Administration. *Results from the 2008 National Survey on Drug Use and Health, National Findings*. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2009.

17. Henggeler SW, Halliday-Boykins CA, Cunningham PB, et al. Juvenile drug court: enhancing outcomes by integrating evidence-based treatments. *J Consulting Clin Psych.* 2006;74:42–54.
18. Vaughn MG, Howard MO. Adolescent substance abuse treatment: a synthesis of controlled evaluations. *Res Soc Work Pract.* 2004; 14:325–335.
19. Tripodi SJ, Bender K, Litschge CM, Vaughn MG. Reducing alcohol use among adolescent substance abusers: a meta-analytic review. *Arch Ped Adol Med.* 2010;164:85–91.
20. Shook JJ, Vaughn MG, Goodkind S, Johnson H. An empirical portrait of youthful offenders who sell drugs. *J Crim Just.* 2011. In press.

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