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Authors

Harrison, Anna
Ramo, Danielle
Hall, Sharon M
[et al.](#)

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Cigarette Smoking, Mental Health, and Other Substance Use Among Court-Involved Youth

Anna Harrison, Ph.D.^{a,b,c,*}, Danielle Ramo, Ph.D.^{b,d}, Sharon Hall, Ph.D.^b, Vanessa Estrada-Gonzalez, B.S.^{a,b}, Marina Tolou-Shams, Ph.D.^{a,b}

^aDepartment of Psychiatry and Weill Institute for Neurosciences, University of California San Francisco, San Francisco, CA USA

^bDivision of Infant, Child, and Adolescent Psychiatry, Zuckerberg San Francisco General Hospital, San Francisco, CA USA

^cMental Health Service, San Francisco VA Medical Center, San Francisco, CA USA

^dHopelab, San Francisco, CA USA

Abstract

Background: Justice-involved youth are at risk to become cigarette smokers as they age, leading to a variety of poor health outcomes. However, little is known about cigarette use among justice-involved youth, especially youth supervised in the community where there is ample opportunity to smoke.

Objective: This study investigates the prevalence of cigarette smoking and the associations between cigarette smoking, emotional and behavioral functioning, and other substance use among a sample of first-time offending court-involved, non-incarcerated (FTO-CINI) youth.

Methods: Youth were recruited from a family court in the Northeast (N=423). Substance use was self-reported using the Adolescent Risk Behavior Assessment (ARBA). Emotional and behavioral functioning was measured using the Behavior Assessment Schedule for Children-Second Edition (BASC-2), the Affect Dysregulation Scale (ADS), National Stressful Events Survey PTSD Short Scale (NSESSS), and the National Survey of Self-Reported Delinquency (NYS-SRD).

Results: 9.9% of FTO-CINI youth had smoked cigarettes in the past 30 days. Compared with FTO-CINI youth who had not smoked recently, recent smokers endorsed more emotional and behavioral symptoms, such as school problems ($p<0.001$), internalizing problems ($p=0.012$), inattention/hyperactivity ($p=0.020$), affect dysregulation ($p=0.044$), PTSD symptoms ($p=0.006$), and delinquent behavior ($p<0.001$). Recent smokers were also more likely to use alcohol (OR=5.61, $p<0.001$), marijuana (OR=11.27, $p<0.001$), and other drugs (OR=5.00, $p<0.001$).

Conclusions: Recent smoking was higher among FTO-CINI youth than youth in the general population. Findings underscore the need to incorporate nicotine into existing substance use

* **Corresponding Author:** Anna Harrison, Ph.D., San Francisco VA Medical Center, 4150 Clement Street, 116B, San Francisco, CA 94121, Anna.Harrison@va.gov.

Declaration of Interest

Drs. Ramo and Hall have consulted to Carrot, Inc., which makes a tobacco cessation device; Dr. Hall is on their advisory board. Dr. Hall has also consulted for BioRealm, Inc.

prevention interventions for this population, who are at high risk to initiate cigarette use as they age.

Keywords

juvenile justice; cigarette smoking; mental health; adolescent substance use

Introduction

The Centers for Disease Control and Prevention (CDC) estimate that 25% of high school students and 7% of middle school students have used one or more tobacco products (including cigarettes, smokeless tobacco, and electronic vaping products) in the past month (Singh et al., 2016). Although the prevalence of cigarette smoking among high school students has declined in recent years, from 15.8% in 2011 to 8.1% in 2018 (Gentzke et al., 2019), each year 733,000 adolescents try cigarettes for the first time and 117,000 initiate daily smoking (Center for Behavioral Health Statistics and Quality, 2018). Early initiation of cigarette use in adolescence is more likely to lead to nicotine dependence and heavier cigarette smoking in adulthood, and can precipitate earlier onset of serious health problems such as chronic obstructive pulmonary disease and lung cancer (Perry and Stauffer, 2013).

Youth involved in the juvenile justice system are at particularly high risk for cigarette smoking. This population of adolescents is more likely to carry a variety of risk factors associated with early onset and chronic cigarette use, such as psychiatric disorders and other substance use. Mood, anxiety, and trauma-related disorders are all associated with adolescent cigarette use in the general population (Fluharty et al., 2017); symptoms of these disorders are common among justice-involved youth (Dierkhising et al., 2013; Teplin et al., 2002; Wasserman et al., 2010). Similarly, other substance use, such as alcohol and marijuana, is closely linked with cigarette smoking among adolescents (Dierker et al., 2013; Oesterle et al., 2004; Patton et al., 2005). These are the two most common substances used by justice-involved youth (Welty et al., 2016).

Prevalence rates of tobacco use are substantially higher among justice-involved youth when compared with youth in the general population. Although detained or incarcerated youth are not included in prevalence estimates of youth smoking conducted by the CDC, researchers estimate that about 70% of youth incarcerated in correctional facilities have ever smoked cigarettes, and about half smoke daily (Cropsey et al., 2008; Ramaswamy et al., 2013). The number of prior arrests is positively associated with the frequency and quantity of cigarette smoking (Ramaswamy et al., 2013). Compared with youth who have never been arrested, youth who have been detained in the past year have over nine times the odds of having nicotine dependence (Ramaswamy et al., 2013).

As they age into young adults, justice-involved youth may be at higher risk to become smokers. Most youth “age out” of delinquent behavior as they become adults and do not re-offend (Moffitt, 1993); yet, compared with their general population peers, those who are formally involved with the justice system are at high risk to become incarcerated as adults (Petitclerc et al., 2013). Smoking is pervasive among adult correctional populations: between 70 and 80% of jail detainees, prison inmates, and community corrections clients are

current smokers (Conklin et al., 2000; Cropsey et al., 2004, 2009). The cigarette smoking rate among adults involved in the justice system is three to four times higher than the rate found in the general population (Cropsey et al., 2004; Kennedy et al., 2016). Cigarette smoking is often a central part of the culture of adult correctional facilities (Cropsey et al., 2009). If youth continue to be involved in the justice system as they age, they are increasingly exposed to smoking and may be at higher risk to become smokers themselves.

Juvenile justice systems are increasingly reliant on diversion versus detention practices (Monahan et al., 2015). Thus, relatively few adolescents who come into contact with the legal system are detained in a secure setting (Belenko et al., 2009). As a result, nearly 80% of all youth live in the community under court supervision while their cases are pending; this community supervision is especially common among youth with no prior arrest history (Furdella and Puzanchera, 2014). These first-time offending, court-involved, non-incarcerated (FTO-CINI) youth may be involved in diversion programs, on probation, or awaiting adjudication of their case. Rates of tobacco use among this population of youth are largely unknown. Because tobacco products are typically banned in juvenile detention, cigarettes may be more available to FTO-CINI youth than their incarcerated or detained counterparts. It is therefore critical to understand patterns and predictors of cigarette use among FTO-CINI youth, as this population represents the majority of justice-involved youth.

To our knowledge, no study has examined cigarette smoking among FTO-CINI youth, nor examined specific emotional and behavioral functioning and other substance use associated with cigarette smoking in this population. One study examined *nicotine dependence* among youth at various stages of justice involvement (Winkelman et al., 2017). Prevalence rates of nicotine dependence were significantly higher among community supervised youth when compared with their non-justice-involved peers. Moreover, a higher level of justice-involvement (i.e. incarceration or detention) was associated with even greater prevalence of nicotine dependence (Winkelman et al., 2017). The current study builds on this work by examining recent and lifetime cigarette smoking among a sample of FTO-CINI youth with the following specific aims: 1) to identify the prevalence rate and demographic differences in cigarette smoking among FTO-CINI youth, and 2) to examine associations between their cigarette smoking behavior, emotional and behavioral functioning and other substance use. In this study, we focus on cigarette smoking due to its high prevalence among justice-involved populations as well as the significant long-term and well-understood health consequences of adolescent cigarette use. Understanding these relationships will aid in the design of empirically-supported nicotine use prevention and smoking cessation programs for juvenile justice populations. FTO-CINI youth are not yet entrenched in the justice system, thus targeted interventions may substantially improve long-term health outcomes.

Materials and Methods

Sample

Participants were 423 first-time offending adolescents recruited from a family court in the Northeastern United States. Youth 12–18 years old were eligible to participate if they had a status¹ or delinquent² petition filed with the court. Participants were excluded from the

study if 1) they had prior offenses, 2) the caregiver was unable/unwilling to participate and/or consent to youth participation, 3) the youth did not speak English and if their caregiver did not speak English or Spanish, 4) they had cognitive impairment that interfered in their ability to respond to assessment questions. Cognitive impairment was determined during the referral process by court intake staff, who had extensive contact with families. Court staff conveyed information about severe, readily apparent cognitive difficulties in youth and caregivers, which could influence the ability to provide informed consent and participate in the study. Although research staff did not conduct formal cognitive assessments for either youth or caregivers prior to enrollment, they were instructed to consult with the principal investigator if they had concerns about cognitive impairment resulting from the screening interview. Five status offenders were excluded due to cognitive impairment.

All potentially eligible participants (2588 families) were alerted to the research study through a letter that accompanied standard paperwork sent to the family notifying them of their first court appointment or hearing (Figure 1). Study staff then screened families when they came to the court. Following initial recruitment, the study received supplementary funds to enroll additional girls because of the potential underrepresentation in the sample and to ensure sufficient statistical power to make gender comparisons. Of the 1529 eligible families approached over the study baseline recruitment period from June 2014-July 2016, 423 youth-caregiver dyads consented/assented to participation.

Procedures

To protect privacy, study staff screened potential participants in a private space inside the court building. The study obtained a Certificate of Confidentiality³ to further protect participants' confidential information. The principal investigator trained research assistants in practices to protect participants' privacy and to store confidential information and data securely, in accordance with guidelines set by the local Institutional Review Board (IRB) and collaborating institutions' Office for Human Research Protections. Research assistants completed caregiver consent, youth assent and baseline study assessments at the participants' homes, in research offices, or in a community space (e.g. local café or library) when appropriate or requested by the youth and/or caregiver. Youth assessments were conducted separately from their caregiver using audio-assisted computerized assessment (ACASI) on a tablet with headphones to ensure privacy. Participants had the ability to repeat questions by selecting this option on the tablet screen. Study staff were accessible to assist with technical difficulties and answer clarifying questions. All study and recruitment procedures were approved by the local IRB and collaborating institutions' Office for Human Research Protections. Although both youth and caregivers completed assessments, the current study includes only data from the adolescent self-report measures.

¹Status petitions are those filed for an offense that is illegal because the youth is a minor (e.g. truancy, alcohol use).

²Delinquency petitions are those filed for offenses that are illegal regardless of minor status (e.g. assault, possession of an illicit substance).

³With some limited exceptions, a Certificate of Confidentiality (CoC) prohibits disclosure of participants' identifiable information to parties not connected to the research study. The CoC is issued by the National Institutes of Health and prohibits disclosure of such information in response to legal demands (e.g., subpoena).

Measures

Demographics—The demographic questionnaire included standard items, such as sex, age, race/ethnicity, educational status, offense type (status/delinquent), household composition, and whether family income fell below the federal poverty level (\$25,100 for a family of four; calculated using participants' estimated income and household composition).

Substance use—The Adolescent Risk Behavior Assessment (ARBA) (Donenberg et al., 2001) measures substance use by assessing whether a youth has *ever* used a specific substance, the age of first use, whether the youth has used the substance in the past 4 months, and the frequency of use in the past 30 days. The ARBA assesses 13 substance classes including: cigarettes, alcohol, marijuana, synthetic marijuana, inhalants, other synthetic drugs, methamphetamines, cocaine, injected cocaine, heroin, club drugs (e.g., ecstasy, “molly”), psychedelic drugs (e.g. acid, “shrooms”), tranquilizers, prescription drugs, and other drugs not listed. We created a composite category, “other drugs,” as an indicator of substance use *other* than alcohol, marijuana, or cigarettes. In the current study, we defined “recent” cigarette smoking as having smoked one or more cigarettes in the past 30 days. Three participants did not respond to questions assessing cigarette use and are therefore coded as missing.

Delinquency—Participants completed the General Delinquency subscale of the National Survey of Self-Reported Delinquency (NYS-SRD) (Elliott et al., 1985; Thornberry and Krohn, 2000). The NYS-SRD is a 40-item, well-validated self-report scale of delinquent acts, such as larceny, fighting, and selling drugs. The original General Delinquency subscale has 24 items, and scores range from 0–24 with higher numbers indicating more delinquent acts. However, due to an error in ACASI development, item 24 (“Have you had sexual intercourse with a person who was not your serious partner when involved in a relationship?”) was not administered to study participants. Therefore, the possible range of scores is 0–23, but still accurately indicates that greater scores represent more delinquent acts. Participants' scores in the current study ranged from 0 to 16.

Emotional and behavioral functioning—The Behavior Assessment System for Children-Second Edition (BASC-2) assesses a wide range of emotional and behavioral symptoms (Reynolds and Kamphaus, 2004). The BASC-2 contains 69 true/false items and 107 items rated on a Likert-type scale from 1 (Never) to 4 (Always). It yields several scales describing mental health and adaptive functioning of youth, all of which demonstrate good to excellent internal consistency (Cronbach's alpha ranges from .84 to .95) (Reynolds and Kamphaus, 2004). Scores were standardized using a sample of youth in the general population and are reported as T-Scores with a mean of 50 and standard deviation of 10. With the exception of adaptive scales, higher scores indicate more symptoms and/or distress.

The following composite scales were included for analysis: School Problems, Internalizing Problems, Inattention/Hyperactivity, and Personal Adjustment. The School Problems scale is a measure of dissatisfaction with school, and includes information about difficulty with teachers, attitudes towards school, and sensation seeking (range: 5–91). The Internalizing Problems scale is a broad index measuring youths' inwardly directed distress. It includes

information regarding the presence of social stress, anxiety, depression, external locus of control, somatization, and low self-esteem (range: 34–99). High scores on the Inattention/Hyperactivity scale may warrant a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) (range: 6–90). Unlike the other BASC-2 composite scales, the Personal Adjustment scale is an adaptive scale where higher scores indicate better functioning. This scale includes information about relationships with parents, peers, self-reliance, and self-esteem (range: 14–69).

The BASC-2 also includes several validity scales (Excessive Negativity, Excessive Positivity, Unusual Response Pattern, Inconsistency in Responses, and Nonsensical or Highly Implausible items), which identify response patterns which are likely invalid. Participants were excluded from analyses that included BASC-2 data if they scored in the “extreme caution” range on one or more validity scales (N=39). Participants who were excluded from analyses tended to be older (14.6 vs. 14.0 years), but did not differ by race/ethnicity, sex, or poverty. Sensitivity analyses including these participants are available from the authors.

Trauma symptoms—Participants completed the National Stressful Events Survey PTSD Short Scale (NSESSS) (LeBeau et al., 2014) and Affect Dysregulation Scale (ADS) (Brown et al., 2012; Pelcovitz et al., 1997) to assess trauma and emotional sequelae. The NSESSS is a 9-item scale developed to screen for the presence of Post-Traumatic Stress Disorder and was administered only to youth who endorsed experiencing a trauma (N=335). Youth rated distress resulting from symptoms connected with the trauma (e.g. nightmares, hypervigilance, etc.) on a scale of 1 (“not at all bothered”) to 5 (“extremely bothered”). Mean total scores may range from 0 to 4 (higher scores indicating more severe posttraumatic stress). Scores in this study ranged from 0 to 4; Cronbach’s alpha=0.95.

The ADS is a validated 6-item measure indicating problems with emotion regulation, often associated with a history of trauma (Brown et al., 2012). Youth rated how frequently they experience problems with their emotions in the past four months on a Likert-type scale ranging from 1 (“not at all”) to 4 (“often”). Items included, “I had trouble controlling my feelings” and “I have felt overwhelmed by strong feelings.” Total scores may range from 6 to 24; higher scores indicate greater affect dysregulation. In the current study, scores ranged from 6 to 24; Cronbach’s alpha=0.88.

Statistical analysis

Analyses included *t*-tests and chi-square tests to examine differences in demographic characteristics between youth who smoked cigarettes in the past month (“recent smokers” yes/no) and those who had not (“non-smokers”). Ordinary least squares (OLS) linear regression and logistic regression were used to examine differences between recent cigarette smokers and non-smokers (independent variable) on their behavioral and emotional functioning and lifetime substance use, respectively. Separate models were run for each outcome. Comparisons of the specific drugs were omitted due to low rates of endorsement that resulted in unstable models as well as to reduce the probability of Type I error. To examine the independent relationship between smoking status and the dependent variables,

we adjusted all regression analyses for demographic variables related to cigarette smoking: race/ethnicity and age. We report unstandardized Beta values, odds ratios, associated confidence intervals, and p -values in the text and tables.

Results

Of the 423 FTO-CINI youth, 90 (21.3%) had ever smoked cigarettes. Of those who had ever smoked, the average age of first cigarette was 13.2 years. Just under half of those who had ever smoked cigarettes had done so in the past 30 days ($n=42$, 46.7%; 9.9% of the total sample). Seven of the 42 recent smokers (7.8%) had smoked every day in the past month. Recent smokers reported cigarette use on a mean of 14.3 of the past 30 days.

Table 1 shows demographic characteristics for the whole sample and examines differences by smoking status. Recent smokers were more likely to be older ($t=-2.09$, $p=0.037$). We also found differences in race/ethnicity ($\chi^2=10.44$, $p=0.015$). Although white participants constitute 30.6% of the overall sample, 50.0% of the recent cigarette smokers identify as white. Alternatively, although Latinx youth made up 43.3% of the overall sample, only 23.8% of recent smokers identified as Latinx.

Cigarette smoking and behavioral and emotional functioning

Recent cigarette smokers exhibited greater difficulties with behavioral and emotional functioning relative to their non-smoking peers (Table 2). Youth who had smoked cigarettes in the past month endorsed more delinquent behaviors than those who had not smoked recently ($B=2.06$, 95% Confidence Interval [CI]: 1.20–2.93, $p<0.001$). Recent cigarette smokers also reported more externalizing symptoms captured by the BASC-2 including school problems ($B=6.93$; 95% CI: 3.07–10.79, $p<0.001$), inattention/hyperactivity ($B=4.97$; 95% CI: 0.77–9.16, $p=0.02$), and internalizing problems ($B=5.75$; 95% CI: 1.29–10.20, $p=0.012$) typically associated with anxiety and depression symptoms. Moreover, recent cigarette smokers also reported more posttraumatic stress. Compared with their non-smoking peers, recent smokers had higher levels of overall trauma symptoms ($B=0.53$; 95% CI: 0.15–0.090, $p=0.006$) and greater emotion dysregulation ($B=1.47$; 95% CI: 0.04–2.90, $p=0.044$).

Cigarette smoking and other substance use

Recent cigarette smokers were highly likely to have used other substances in their lifetimes (Table 3). Compared with non-smokers, recent smokers had over five times the odds of ever using alcohol, over 11 times the odds of ever using marijuana, and five times the odds of ever using another drug.

Discussion

About 1 in 5 first-time offending, court-involved (FTO-CINI) youth had *ever* tried cigarettes, and about one tenth were *current* cigarette smokers. The rate of lifetime cigarette use in this population is similar to the lifetime prevalence rate found in similarly-aged general population youth in this region, measured using comparable items (Centers for Disease Control and Prevention, 2018).⁴ However, FTO-CINI youth were more likely to be current

smokers: past-30 day cigarette use rate (excluding other tobacco products) was about three times the rate estimated for general population youth (3.1%) (Centers for Disease Control and Prevention, 2018). In other words, FTO-CINI youth appear to be equally likely as their peers in the general population to experiment with cigarettes, but those who have tried cigarettes are more likely to use them currently. Youth who initiate smoking earlier are more likely to become chronic smokers (Kendler et al., 2013). The relatively high rate of current smoking among these youth signals that cigarette smoking may be a more serious problem for this population, compared with their peers in the general population, regardless of whether or not they re-offend or become incarcerated in the future.

We found demographic differences in smoking status. In our sample, white youth were over-represented in the group of recent smokers, whereas Latinx youth were under-represented. This finding contrasts with estimates from the general population of adolescents in this jurisdiction, where white and Latinx youth have similar prevalence of recent cigarette smoking (Centers for Disease Control and Prevention, 2018). However, our findings are consistent with other studies of justice-involved youth, in which white participants typically have higher rates of cigarette smoking (Cropsey et al., 2008) as well as other substance use (Welty et al., 2016) compared with minority youth. In our sample, older adolescents were more likely to smoke; this is also consistent with prior work (Cropsey et al., 2008). Notably, poverty status was not associated with recent smoking. While data linking low income with tobacco use is robust for adults (Flint and Novotny, 1997; Leventhal et al., 2019), data for adolescents is mixed (Mistry et al., 2011). Among adolescent populations, local income inequality—instead of poverty status—may be a more robust predictor of smoking (Mistry et al., 2011). Future work may wish to incorporate measures of inequality instead of poverty status.

We also found associations between cigarette smoking and a variety of emotional and behavioral symptoms. Smoking is associated with externalizing behaviors, such as ADHD symptoms, problems at school, and delinquency. Cigarette smoking may therefore be one behavior among a constellation of these externalizing symptoms which often co-occur (Griffin et al., 2003). In this population of FTO-CINI youth, which researchers and policymakers typically characterize in terms of their externalizing problems, it is important to emphasize that cigarette smoking was also closely related to internalizing and trauma symptoms. Because externalizing symptoms demand attention from caregivers, clinicians, and the justice system, internalizing symptoms such as anxiety and depression are often undetected and unaddressed in high-risk youth (Perrino et al., 2016). However, our findings underscore prior work showing that internalizing problems, particularly anxiety, are connected to cigarette use among young people (Isensee et al., 2003; Johnson et al., 2000). Smoking rates are particularly high among youth who reported at least one traumatic exposure (Feldner et al., 2007). For this sample of court-involved youth, many of whom have experienced significant trauma, cigarettes may be a strategy to cope with stress. Addressing internalizing symptoms and trauma may be one avenue to decrease or prevent smoking in this high-risk population.

⁴Lifetime cigarette smoking in the jurisdiction from where these youth were sampled is estimated to be approximately 18%, lower than the national average of 25.1% (Centers for Disease Control and Prevention, 2018).

Findings are also consistent with prior studies showing a strong relationship between smoking and other substance use (Choi et al., 2018; Moss et al., 2015, 2014). In the current sample, over 90% of cigarette smokers had ever used marijuana, and more than 70% of smokers had ever used alcohol. The overlap among these three behaviors mirrors findings in other adolescent samples (Choi et al., 2018; Moss et al., 2015, 2014). Polysubstance use is indicative of psychological distress (Kelly et al., 2015) and may predict substance use problems in young adulthood (Moss et al., 2014). Rates of drug use other than alcohol and marijuana were also high—about 40%—among recent cigarette smokers. Many juvenile justice systems across the country routinely screen for substance use (Knight et al., 2016). For those who screen positive, justice systems should also assess cigarette use to understand the full scope of substance use in to inform intervention.

Although FTO-CINI youth are at risk to become regular cigarette smokers, few juvenile justice systems across the country offer smoking cessation interventions. Youth often present to the justice system with multiple complex mental health and substance use concerns; therefore, cigarette smoking may be seen as a lower priority. However, if youth continue to have contact with the justice system over time, repeated or prolonged exposure to such settings may increase their risk of cigarette smoking (Winkelman et al., 2017). Cigarette smoking, emotional and behavioral difficulties, and other substance use are all each associated with a variety of poor health outcomes over the long-term, and the combined effects of these factors may exacerbate serious health problems. For example, co-occurring alcohol and tobacco use increases the risk of certain cancers (Anantharaman et al., 2011; Hashibe et al., 2009) and can worsen the long-term cognitive effects of alcohol use alone (Kalman et al., 2010). Findings from the current study, as well as other recent work (Ramaswamy et al., 2013; Winkelman et al., 2017), may serve to increase buy-in from stakeholders to screen youth for nicotine use at first point of contact with the justice system, particularly for those residing in the community. Providing smoking cessation interventions may help to curb smoking and improve overall health over the life-course. Screening and interventions conducted while youth are in their natural environment will have more “real-world” applicability and generalizability than those imposed on youth merely as a function of secure detention setting constraints.

Limitations

These data are subject to the limitations of self-report. Participants may have had concerns about answering questions on sensitive topics and potentially illicit behavior, which could have led to underreporting of certain symptoms or behaviors. Study procedures aimed to minimize concerns regarding privacy and confidentiality, for example by obtaining a certificate of confidentiality, completing assessments in a private area, and giving participants assurances of confidentiality during written consent. Rates of self-reported substance use were high, suggesting that youth likely felt comfortable reporting sensitive behaviors.

We did not assess patterns of cigarette smoking, such as the time of first cigarette or the number of cigarettes per day. These data would be extremely useful to anticipate future smoking habits and health concerns. However, as only 7 of the 423 participants reported

daily cigarette smoking, we do not have the statistical power to analyze more fine-grained patterns of smoking behavior. Although previous studies describe substantial differences in smoking rates between middle school and high school students, we did not have the statistical power to conduct separate analyses by age or educational status. In the current study, we chose to focus on cigarette smoking due to its high prevalence among justice-involved populations; we did not include measures of e-cigarette use, whose popularity among youth has increased sharply in recent years.

To be analytically conservative, participants were excluded if they scored in the “extreme caution” range on the Excessive Negativity scale of the BASC-2, a measure of excessive negative reporting of symptoms. However, this decision may have excluded participants who legitimately experienced extremely high levels of psychiatric distress, particularly since these types of mental health concerns are more common among justice-involved youth than in the general adolescent population. Analyses comparing those excluded and those not excluded only revealed differences by age; yet, given the focus of the BASC-2 for this study, it felt most methodologically appropriate to exclude those that the tool identified as having unreliable and invalid response patterns.

Lastly, generalizability to other jurisdictions may be limited given that data were collected from one family court jurisdiction in one US region and adolescent cigarette smoking rates in this same area are lower than the national average. Moreover, as we are unable to compare those who enrolled in this study with those who did not, our sample may not be representative of the population of FTO-CINI youth. We excluded youth who did not speak English, and caregivers that spoke languages other than English or Spanish, thus limiting generalizability to a more diverse array of cultures. Nevertheless, this is a large and novel sample of court-involved youth, assessed within one month of first-time juvenile court involvement. Data can contribute to how other juvenile courts, diversion programs and community-based services might begin to consider how to screen, assess and intervene upon nicotine use in justice-involved youth in their own jurisdictions.

Future directions

Our data point toward several avenues for future research. Given the increasing popularity of e-cigarette use among youth throughout the United States, it is important to extend our study to include nicotine consumption of different modalities beyond cigarettes. Recent data suggest that over 40% of youth have ever tried e-cigarettes (Centers for Disease Control and Prevention, 2018). Although e-cigarettes may be an effective cigarette smoking cessation tool for some adults (Kalkhoran and Glantz, 2016), recent studies show that e-cigarettes may in fact increase the likelihood of combustible cigarette smoking among adolescents (Soneji et al., 2017). Therefore, understanding the relationship of e-cigarette use to emotional and behavioral functioning and other substance use, and how this may differ from traditional cigarettes, will be a critical next step in this nascent area of research.

As data in this area remains scarce, future work should also examine longitudinal patterns and predictors of smoking initiation among juvenile justice youth—particularly community-supervised youth. Youth with substance use and psychiatric symptoms are at especially risk for recidivism (Schubert et al., 2011), and are even more likely to become involved in the

adult justice system (Hoeve et al., 2013). Given the high rates of cigarette smoking among adult correctional populations, it is possible that increased justice involvement over time may be associated with increased risk for smoking initiation and continued cigarette use, but this requires further study.

These data should be used to create targeted smoking prevention and cessation programs aimed at youth involved in the justice system. Given the strong associations among cigarette smoking, mental health, and other substance use, programs should incorporate findings from this work into already existing mental health and/or substance use prevention interventions. For example, for youth who use nicotine as a method of regulating trauma symptoms, successful programs may emphasize developing healthier coping skills to manage stress. For youth with co-occurring alcohol and cigarette use, cessation efforts may involve identifying alcohol as a trigger for smoking.

Conclusions

Justice-involved youth are at high risk of becoming cigarette smokers as they age. Among first-time offending youth, cigarette smoking is strongly associated with a variety of emotional and behavioral symptoms as well as other substance use. Data can inform the development and tailoring of empirically-supported smoking cessation and prevention interventions for the juvenile justice population.

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References

- Anantharaman D, Marron M, Lagiou P, Samoli E, Ahrens W, Pohlabein H, Slamova A, Schejbalova M, Merletti F, Richiardi L, Kjaerheim K, Castellsague X, Agudo A, Talamini R, Barzan L, Macfarlane TV, Tickle M, Simonato L, Canova C, Conway DI, McKinney PA, Thomson P, Znaor A, Healy CM, McCartan BE, Hashibe M, Brennan P, Macfarlane GJ, 2011 Population attributable risk of tobacco and alcohol for upper aerodigestive tract cancer. *Oral Oncol* 47, 725–31. 10.1016/j.oraloncology.2011.05.004 [PubMed: 21684805]
- Belenko S, Dembo R, Rollie M, Childs K, Salvatore C, 2009 Detecting, Preventing, and Treating Sexually Transmitted Diseases Among Adolescent Arrestees: An Unmet Public Health Need. *Am. J. Public Health* 99, 1032–1041. 10.2105/AJPH.2007.122937 [PubMed: 19372535]
- Brown LK, Houck C, Lescano C, Donenberg G, Tolou-Shams M, Mello J, 2012 Affect Regulation and HIV Risk Among Youth in Therapeutic Schools. *AIDS Behav* 16, 2272–2278. 10.1007/s10461-012-0220-3 [PubMed: 22669595]

- Center for Behavioral Health Statistics and Quality, 2018 Results from the 2017 National Survey on Drug Use and Health: Detailed Tables.
- Centers for Disease Control and Prevention, 2018 Youth Online: High School YRBS [WWW Document]. Youth Risk Behav. Surveill. Syst URL <https://nccd.cdc.gov/youthonline/App/Results.aspx?LID=XX> (accessed 4.30.18).
- Choi HJ, Lu Y, Schulte M, Temple JR, 2018 Adolescent substance use: Latent class and transition analysis. *Addict. Behav* 10.1016/j.addbeh.2017.09.022
- Conklin TJ, Lincoln T, Tuthill RW, 2000 Self-reported health and prior health behaviors of newly admitted correctional inmates. *Am. J. Public Health* 90, 1939–41. [PubMed: 11111273]
- Cropsey K, Eldridge GD, Ladner T, 2004 Smoking among female prisoners: An ignored public health epidemic. *Addict. Behav* 29, 425–431. 10.1016/j.addbeh.2003.08.014 [PubMed: 14732432]
- Cropsey KL, Jones-Whaley S, Jackson DO, Hale GJ, 2009 Smoking characteristics of community corrections clients. *Nicotine Tob. Res* 12, 53–58. 10.1093/ntr/ntp172 [PubMed: 19996145]
- Cropsey KL, Linker JA, Waite DE, 2008 An analysis of racial and sex differences for smoking among adolescents in a juvenile correctional center. *Drug Alcohol Depend* 92, 156–163. 10.1016/j.drugalcdep.2007.07.018 [PubMed: 17869028]
- Dierker L, Selya A, Piasecki T, Rose J, Mermelstein R, 2013 Alcohol problems as a signal for sensitivity to nicotine dependence and future smoking. *Drug Alcohol Depend.* 132, 688–693. 10.1016/j.drugalcdep.2013.03.018 [PubMed: 23660243]
- Dierkhising CB, Ko SJ, Woods-Jaeger B, Briggs EC, Lee R, Pynoos RS, 2013 Trauma histories among justice-involved youth: Findings from the National Child Traumatic Stress Network. *Eur. J. Psychotraumatol* 4 10.3402/ejpt.v4i0.20274
- Donenberg GR, Emerson E, Bryant FB, Wilson H, Weber-Shifrin E, 2001 Understanding AIDS-risk behavior among adolescents in psychiatric care: links to psychopathology and peer relationships. *J. Am. Acad. Child Adolesc. Psychiatry* 40, 642–53. 10.1097/00004583-200106000-00008 [PubMed: 11392341]
- Elliott DS, Huizinga D, Ageton SS, 1985 Explaining delinquency and drug use. Sage Publications.
- Feldner MT, Babson KA, Zvolensky MJ, 2007 Smoking, traumatic event exposure, and post-traumatic stress: A critical review of the empirical literature. *Clin. Psychol. Rev* 27, 14–45. 10.1016/j.cpr.2006.08.004 [PubMed: 17034916]
- Flint AJ, Novotny TE, 1997 Poverty status and cigarette smoking prevalence and cessation in the United States, 1983–1993: The independent risk of being poor. *Tob. Control* 10.1136/tc.6.1.14
- Fluharty M, Taylor AE, Grabski M, Munafò MR, 2017 The association of cigarette smoking with depression and anxiety: A systematic review. *Nicotine Tob. Res* 19, 3–13. 10.1093/ntr/ntw140 [PubMed: 27199385]
- Furdella J, Puzzantera C, 2014 Delinquency Cases in Juvenile Court, 2013. U.S. Dep. Justice, Off. Justice Programs, Off. Juv. Justice Delinq. Prev <https://doi.org/NCJ 248899>
- Gentzke AS, Creamer ML, Cullen KA, Ambrose BK, Willis G, Jamal A, King BA, 2019 Vital Signs: Tobacco Product Use Among Middle and High School Students - United States, 2011–2018. *MMWR. Morb. Mortal. Wkly. Rep* 68, 157–164. 10.15585/mmwr.mm6806e1 [PubMed: 30763302]
- Griffin KW, Botvin GJ, Scheier LM, Doyle MM, Williams C, 2003 Common predictors of cigarette smoking, alcohol use, aggression, and delinquency among inner-city minority youth. *Addict. Behav* 28, 1141–1148. 10.1016/S0306-4603(02)00225-3 [PubMed: 12834656]
- Hashibe M, Brennan P, Chuang S, Boccia S, Castellsague X, Chen C, Curado MP, Maso LD, Daudt AW, Fabianova E, Fernandez L, Wünsch-Filho V, Franceschi S, Hayes RB, Herrero R, Kelsey K, Koifman S, La Vecchia C, Lazarus P, Levi F, Lence JJ, Mates D, Matos E, Menezes A, McClean MD, Muscat J, Eluf-Neto J, Olshan AF, Purdue M, Rudnai P, Schwartz SM, Smith E, Sturgis EM, Szeszenia-Dabrowska N, Talamini R, Wei Q, Winn DM, Shangina O, Pilarska A, Zhang Z-F, Ferro G, Berthiller J, Boffetta P, 2009 Interaction between tobacco and alcohol use and the risk of head and neck cancer: pooled analysis in the INHANCE consortium. *Cancer Epidemiol. Biomarkers Prev* 18, 541–550. 10.1158/1055-9965.EPI-08-0347 [PubMed: 19190158]
- Hoeve M, McReynolds LS, Wasserman GA, 2013 The Influence of Adolescent Psychiatric Disorder on Young Adult Recidivism. *Crim. Justice Behav* 40, 1368–1382. 10.1177/0093854813488106

- Isensee B, Wittchen H, Stein MB, Höfler M, Lieb R, 2003 Smoking Increases the Risk of Panic. *Arch. Gen. Psychiatry* 60, 692–700. 10.1001/archpsyc.60.7.692 [PubMed: 12860773]
- Johnson JG, Cohen P, Pine DS, Klein DF, Kason S, Brook Judith S., 2000 Association between cigarette smoking and anxiety disorders during adolescence and early adulthood. *JAMA* 284, 2348–2351. [PubMed: 11066185]
- Kalkhoran S, Glantz SA, 2016 E-cigarettes and smoking cessation in real-world and clinical settings: A systematic review and meta-analysis. *Lancet Respir. Med.* 4, 116–128. 10.1016/S2213-2600(15)00521-4 [PubMed: 26776875]
- Kalman D, Kim S, DiGirolamo G, Smelson D, Ziedonis D, 2010 Addressing tobacco use disorder in smokers in early remission from alcohol dependence: the case for integrating smoking cessation services in substance use disorder treatment programs. *Clin. Psychol. Rev* 30, 12–24. 10.1016/j.cpr.2009.08.009 [PubMed: 19748166]
- Kelly AB, Chan GCK, Mason WA, Williams JW, 2015 The relationship between psychological distress and adolescent polydrug use. *Psychol. Addict. Behav* 29, 787–793. 10.1037/adb0000068 [PubMed: 26415064]
- Kendler KS, Myers J, Damaj MI, Chen X, 2013 Early smoking onset and risk for subsequent nicotine dependence: A monozygotic co-twin control study. *Am. J. Psychiatry* 170, 408–413. 10.1176/appi.ajp.2012.12030321 [PubMed: 23318372]
- Kennedy SM, Sharapova SR, Beasley DD, Hsia J, 2016 Cigarette Smoking Among Inmates by Race/Ethnicity: Impact of Excluding African American Young Adult Men From National Prevalence Estimates. *Nicotine Tob. Res.* 18, S73–S78. 10.1093/ntr/ntv157 [PubMed: 26980867]
- Knight DK, Belenko S, Wiley T, Robertson AA, Arrigona N, Dennis M, Bartkowski JP, McReynolds LS, Becan JE, Knudsen HK, Wasserman GA, Rose E, DiClemente R, Leukefeld C, Cooperative J-T, 2016 Juvenile Justice-Translational Research on Interventions for Adolescents in the Legal System (JJ-TRIALS): a cluster randomized trial targeting system-wide improvement in substance use services. *Implement. Sci* 11 10.1186/s13012-016-0423-5
- LeBeau R, Mischel E, Resnick H, Kilpatrick D, Friedman M, Craske M, 2014 Dimensional assessment of posttraumatic stress disorder in DSM-5. *Psychiatry Res* 218, 143–7. 10.1016/j.psychres.2014.03.032 [PubMed: 24746390]
- Leventhal AM, Bello MS, Galstyan E, Higgins ST, Barrington-Trimis JL, 2019 Association of Cumulative Socioeconomic and Health-Related Disadvantage with Disparities in Smoking Prevalence in the United States, 2008 to 2017. *JAMA Intern. Med* 10.1001/jamainternmed.2019.0192
- Mistry R, McCarthy WJ, de Vogli R, Crespi CM, Wu Q, Patel M, 2011 Adolescent smoking risk increases with wider income gaps between rich and poor. *Heal. Place* 10.1016/j.healthplace.2010.10.004
- Moffitt TE, 1993 Adolescence-Limited and Life-Course-Persistent Antisocial Behavior: A Developmental Taxonomy. *Psychol. Rev* 10.1037/0033-295X.100.4.674
- Monahan K, Steinberg L, Piquero AR, 2015 Juvenile Justice Policy and Practice: A Developmental Perspective. *Crime and Justice* 44, 577–619. 10.1086/681553
- Moss HB, Chen CM, Yi H, 2014 Early adolescent patterns of alcohol, cigarettes, and marijuana polysubstance use and young adult substance use outcomes in a nationally representative sample. *Drug Alcohol Depend* 136, 51–62. 10.1016/j.drugalcdep.2013.12.011 [PubMed: 24434016]
- Moss HB, Goldstein RB, Chen CM, Yi HY, 2015 Patterns of use of other drugs among those with alcohol dependence: Associations with drinking behavior and psychopathology. *Addict. Behav* 10.1016/j.addbeh.2015.06.041
- Oesterle S, Hill KG, Hawkins JD, Guo J, Catalano RF, Abbott RD, 2004 Adolescent heavy episodic drinking trajectories and health in young adulthood. *J. Stud. Alcohol* 65, 204–12. [PubMed: 15151351]
- Patton GC, Coffey C, Carlin JB, Sawyer SM, Lynskey M, 2005 Reverse gateways? Frequent cannabis use as a predictor of tobacco initiation and nicotine dependence. *Addiction* 100, 1518–1525. 10.1111/j.1360-0443.2005.01220.x [PubMed: 16185213]

- Pelcovitz D, Van der Kolk BD, Roth S, Mandel F, Kaplan S, Resick P, 1997 Development of a criteria set and a structured interview for disorders of extreme stress (SIDES). *J. Trauma. Stress* 10, 3–16. 10.1023/A:1024800212070 [PubMed: 9018674]
- Perrino T, Pantin H, Huang S, Brincks A, Brown CH, Prado G, 2016 Reducing the risk of internalizing symptoms among high-risk Hispanic youth through a family intervention: A randomized controlled trial. *Fam Process* 55, 91–106. [PubMed: 25683164]
- Perry CL, Stauffer MJ, 2013 Tobacco Use, in: DiClemente RJ, Hansen WB, Ponton LE (Eds.), *Handbook of Adolescent Health Risk Behavior*. Springer Science & Business Media, LLC, New York, NY, pp. 53–82.
- Petitelcerc A, Gatti U, Vitaro F, Tremblay RE, 2013 Effects of juvenile court exposure on crime in young adulthood. *J. Child Psychol. Psychiatry Allied Discip* 54, 291–297. 10.1111/j.1469-7610.2012.02616.x
- Ramaswamy M, Faseru B, Cropsey KL, Jones M, Deculus K, Freudenberg N, 2013 Factors associated with smoking among adolescent males prior to incarceration and after release from jail: a longitudinal study. *Subst Abus. Treat Prev Policy* 8, 37 10.1186/1747-597x-8-37
- Reynolds CR, Kamphaus RW, 2004 *Behavior Assessment System for Children*. John Wiley & Sons, New York, NY.
- Schubert CA, Mulvey EP, Glasheen C, 2011 Influence of mental health and substance use problems and criminogenic risk on outcomes in serious juvenile offenders. *J. Am. Acad. Child Adolesc. Psychiatry* 10.1016/j.jaac.2011.06.006
- Singh T, Arrazola RA, Corey CG, Husten CG, Neff LJ, Homa DM, King BA, 2016 Tobacco Use Among Middle and High School Students — United States, 2011–2015, Centers for Disease Control, Morbidity and Mortality Weekly Report. 10.15585/mmwr.mm6514a1
- Soneji S, Barrington-Trimis JL, Wills TA, Leventhal AM, Unger JB, Gibson LA, Yang JW, Primack BA, Andrews JA, Miech RA, Spindle TR, Dick DM, Eissenberg T, Hornik RC, Dang R, Sargent JD, 2017 Association between initial use of e-cigarettes and subsequent cigarette smoking among adolescents and young adults a systematic review and meta-analysis. *JAMA Pediatr* 171, 788–797. 10.1001/jamapediatrics.2017.1488 [PubMed: 28654986]
- Teplin LA, Abram KM, McClelland GM, Dulcan MK, Mericle AA, 2002 Psychiatric disorders in youth in juvenile detention. *Arch. Gen. Psychiatry* 59, 1133–1143. [PubMed: 12470130]
- Thornberry TP, Krohn MD, 2000 The Self-Report Method for Measuring Delinquency and Crime, in: Duffee D (Ed.), *Measurement and Analysis of Crime and Justice*. U.S. Department of Justice, Washington, D.C., pp. 33–83. 10.2307/1141583
- Wasserman GA, McReynolds LS, Schwalbe CS, Keating JM, Jones SA, 2010 Psychiatric disorder, comorbidity, and suicidal behavior in juvenile justice youth. *Crim. Justice Behav* 37, 1361–1376. 10.1177/0093854810382751
- Welty LJ, Harrison AJ, Abram KM, Olson ND, Aaby DA, McCoy KP, Washburn JJ, Teplin LA, 2016 Health Disparities in Drug-and Alcohol-Use Disorders: A 12-Year Longitudinal Study of Youths After Detention. *Am. J. Public Health* 106, e1–e9. 10.2105/AJPH.2015.303032
- Winkelman TNA, Frank JW, Binswanger IA, Pinals DA, 2017 Health Conditions and Racial Differences Among Justice-Involved Adolescents, 2009 to 2014. *Acad Pediatr* 17, 723–731. 10.1016/j.acap.2017.03.003 [PubMed: 28300655]

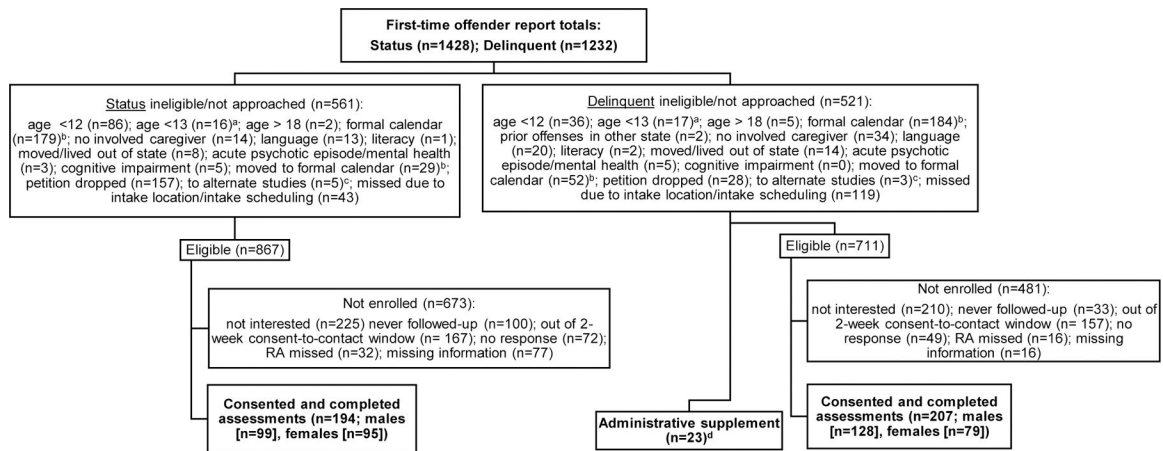


Figure 1.
Participant flowchart

Abbreviation: RA, research assistant

^aIn the pilot phase of the study, adolescent eligibility was restricted to ages 13 through 18 years; it was then expanded to adolescents age 12 years.

^bThe “formal calendar” refers to court hearings (i.e., cases presented by a judge before or instead of an intake appointment).

^cCaregivers or adolescents involved in other justice-related studies conducted by our group were not eligible to concurrently be enrolled in this study.

^dFollowing initial recruitment, the study received additional funding to enroll additional female adolescent into the study because of the potential underrepresentation in our sample.

Table 1.Demographic Characteristics of Full Sample (n=423) and Differences According to Smoking Status^a

Characteristic (No., %) ^b	Full Sample (n=423)	Non-Smokers ^c (n=378)	Recent Smokers ^d (n=42)	χ^2 or <i>t</i> ^e	p-value
Gender				1.32	0.516
Male	228 (53.90)	206 (54.64)	19 (46.34)		
Female	193 (45.63)	169 (44.83)	22 (53.66)		
Other	2 (0.47)	2 (0.53)	0 (0.00)		
Race/Ethnicity				10.44	0.015
Latinx	181 (42.79)	169 (44.71)	10 (23.81)		
White	128 (30.26)	106 (28.04)	21 (50.00)		
Black/African American	42 (9.93)	39 (10.32)	3 (7.14)		
Other	67 (15.84)	59 (15.61)	8 (19.05)		
Refused to answer	5 (1.18)	5 (1.32)	0 (0.00)		
Age (years), Mean (SD)	14.55 (1.53)	14.51 (1.54)	15.02 (1.41)	-2.09	0.037
Offense type				1.54	0.215
Status	194 (45.86)	169 (44.71)	23 (54.76)		
Delinquent	229 (54.13)	209 (55.29)	19 (45.24)		
Educational Status				1.71	0.424
Middle School	163 (38.53)	149 (39.42)	13 (30.95)		
High School	256 (60.52)	225 (59.52)	29 (69.05)		
Other	4 (0.95)	4 (1.06)	0 (0.00)		
Family Below Poverty Line	171 (42.54)	157 (43.85)	12 (29.27)	3.21	0.073
No. children <18 yrs living in the home, Mean (SD)	2.61 (1.67)	2.64 (1.69)	2.43 (1.50)	0.79	0.428
No. adults >18 yrs living in the home, Mean (SD)	2.14 (1.07)	2.14 (1.08)	2.12 (0.86)	0.12	0.901
Both mother figure and father figure living in home	193 (46.73)	172 (46.49)	21 (50.00)	0.19	0.665

Abbreviations: No., Number; SD, Standard Deviation^aOf the 423 total participants, 420 answered questions about smoking; 3 refused to answer^bPercentages may not add to 100 due to rounding error.^cHas *not* smoked cigarettes past 30 days^dHas smoked cigarettes past 30 days^eDemographic differences between Non-Smokers and Recent Smokers were assessed using either χ^2 -square tests (for categorical variables) or *t*-tests (for continuous variables)

Table 2.

Behavioral and Emotional Functioning for Non-Smokers and Recent Smokers^a

Measures, Mean (SD)	Full Sample (n=423)	Non-Smokers ^b (n=378)	Recent Smokers ^c (n=42)	B	(95% CI)	p-value
NYS: General Delinquency	2.11 (2.72)	1.88 (2.49)	4.07 (3.70)	2.06	(1.21 – 2.93)	0.000
BASC-2 Subscale						
School Problems	53.13 (11.08)	52.42 (10.77)	59.81 (11.45)	6.93	(3.07 – 10.79)	0.000
Internalizing Problems	51.76 (12.92)	51.03 (12.66)	57.06 (13.01)	5.75	(1.29 – 10.20)	0.012
Inattention/Hyperactivity	54.82 (12.23)	54.16 (12.13)	59.81 (11.45)	4.97	(0.77 – 9.16)	0.020
Personal Adjustment	47.25 (10.36)	47.63 (10.11)	44.08 (11.97)	-3.19	(-6.76 – 0.38)	0.080
Trauma Symptoms						
NSESS	1.14 (1.07)	1.09 (1.05)	1.60 (1.17)	0.53	(0.15 – 0.90)	0.006
ADS	12.87 (4.38)	12.71 (4.35)	14.30 (4.46)	1.47	(0.04 – 2.90)	0.044

Abbreviations: BASC-2, Behavior Assessment System for Children-Second Edition; NSESS, National Stressful Events Survey PTSD Short Scale; ADS, Affect Dysregulation Scale; NYS, National Survey of Self-Reported Delinquency; B, Beta Value; CI, confidence interval

Note: All regression models have recent smoking as a dependent variable and behavioral/emotional functioning score as an independent variable. Models are adjusted for age and race.

^aOf the 423 total participants, 420 answered questions about smoking; 3 refused to answer

^bHas *not* smoked cigarettes past 30 days

^cHas smoked cigarettes past 30 days

Table 3.

Lifetime Substance Use for Non-Smokers and Recent Smokers^a

Lifetime Substance Use, %	Full Sample (n=423)	Non-Smokers ^b (n=378)	Recent Smokers ^c (n=42)	OR	(95% CI)	p-value
Alcohol	32.94	28.52	71.43	5.61	(2.68 – 11.91)	0.000
Marijuana	49.28	44.59	90.48	11.27	(3.83 – 34.67)	0.000
Other Drugs	13.38	10.05	41.46	5.00	(2.49 – 10.92)	0.000

Abbreviations: OR, odds ratio; CI, confidence interval

Note: Logistic regression models have recent smoking as a dependent variable and lifetime substance use as an independent variable. Models are adjusted for age and race.

^a Of the 423 total participants, 420 answered questions about smoking; 3 refused to answer

^b Has *not* smoked cigarettes past 30 days

^c Has smoked cigarettes past 30 days