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Crime and Psychiatric Disorders Among Youth in the US Population: An Analysis of National Comorbidity Survey-Adolescent Supplement

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Abstract

Objective—Current knowledge regarding psychiatric disorders and crime in youth is limited to juvenile justice and community samples. This study examined relationships between psychiatric disorders and self-reported crime involvement in a sample of youth representative of the US population.

Method—The National Comorbidity Survey-Adolescent Supplement (N=10,123; ages 13–17; 2001–2004) was used to examine the relationship between lifetime *DSM-IV*-based diagnoses, reported crime (property, violent, other), and arrest history. Logistic regression compared the odds of reported crime involvement with specific psychiatric disorders to those without any diagnoses, and examined the odds of crime by psychiatric comorbidity.

Results—Prevalence of crime was 18.4%. Youth with lifetime psychiatric disorders, compared to no disorders, had significantly greater odds of crime, including violent crime. For violent crime resulting in arrest, conduct disorder (CD; OR=57.5; 95% CI=30.4,108.8), alcohol use disorders (OR=19.5; 95% CI=8.8,43.2), and drug use disorders (OR=16.1; 95% CI=9.3,27.7) had the greatest odds with similar findings for violent crime with no arrest. Psychiatric comorbidity increased the odds of crime. Youth with 3 or more diagnoses (16.0% of population) accounted for 54.1% of those reporting arrest for violent crime. Youth with at least 1 diagnosis committed 85.8% of crime, which was reduced to 67.9% by removing those with CD. Importantly, 88.2% of youth with mental illness report never committing any crime.

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Conclusion—Our findings highlight the importance of improving access to mental health services for youthful offenders in community settings given the substantial associations found between mental illness and crime in this nationally representative epidemiological sample.

Keywords

youth; psychiatric disorders; crime; arrest; US population

Introduction

The relationship between crime and mental illness is an issue often in the national spotlight. While large-scale, nationally representative epidemiological studies have established associations between crime and mental illness in adults,^{1–3} such investigations have not been conducted with adolescent samples, resulting in a lack of data to inform critical prevention and intervention efforts occurring within mental health and juvenile justice systems.

Population studies examining crime and mental illness have generated an understanding of the complexity of this relationship in adults. For example, some studies have found that the presence of severe mental disorders and substance use disorders in adults is generally associated with property crimes,⁴ and the presence of psychotic symptoms elevates their risk to commit a violent offense.⁵ Other studies using prospective longitudinal evaluations of crime and mental illness in adults find that violent crime is modestly associated with psychiatric disorders, and this relationship is strengthened when substance use disorders are comorbid with other psychiatric disorders.^{1, 2}

Current knowledge about associations between crime and mental illness in adolescents comes mainly from youth involved with the juvenile justice system,⁶ a population that has high rates of psychiatric comorbidity,^{7, 8} when compared with their non-arrested peers.⁹ Several studies also demonstrate strong relationships between substance use and arrests for both violent and nonviolent crime.^{10, 11} Studies have found that detained youth were more than twice as likely as those not incarcerated to have an externalizing disorder.⁷ Other studies based on juvenile justice samples found that on average, nearly one fourth of the youth met criteria for any affective disorder or anxiety disorder, and as many as one-half met criteria for any disruptive behavior disorder or any substance use disorder.⁸ Additionally, research based on self-reported offending patterns among large scale adolescent community samples found that violent offenders had significant externalizing symptoms¹² and disproportionately used alcohol and marijuana.¹³

The extent and strength of association between crime and mental illness in adolescence in the general US population is unclear. Further, we know little about the association between mental illness and crime among youth who are not arrested. This is an important limitation because only a small percentage of youth are arrested for their crimes, and even fewer are referred to juvenile court.¹⁴ Most offenses committed by youth include status offenses, property offenses, and some violent offenses which do not result in serious injury and therefore are not reported to the authorities.¹⁴ It is also unknown whether existing findings from justice or community-based samples of youth apply more broadly to the larger portion

of youth and crimes that are not reported to criminal justice agencies,^{13, 15} highlighting the importance of examining this issue in epidemiological-level samples.

The present study examined self-reported arrests and crime using data from the National Comorbidity Survey-Adolescent Supplement (NCS-A). The NCS-A is the only nationally representative sample available which includes *DSM-IV*-based diagnostic data on youth aged 13 to 18,¹⁶ and includes reported crime. The goals of this report are to (1) describe the relationship between specific psychiatric disorders and reported crime involvement (violent, property, other), distinguishing between youths arrested for crime versus youth who have never been arrested, and (2) examine whether associations between psychiatric disorders and crime strengthen with increasing numbers of psychiatric comorbidities.

Method

The NCS-A is a nationally representative, face-to-face survey administered to adolescents (aged 13–17 years) between February 2, 2001 and January 31, 2004 by professional interviewers from the Institute for Social Research at the University of Michigan, Ann Arbor. The NCS-A used a dual-frame sample that included household and school subsamples.^{16, 17} The household sample consisted of 904 adolescents, and the school sample consisted of 9,244 adolescents. The response rates were 82.5% for the household sample and 83.7% for the school sample. The Human Subjects Committee of both Harvard Medical School and the University of Michigan approved the recruitment and consent procedures. The study also obtained a certificate of confidentiality, and this was documented and explained in the parental and adolescent consent forms. The interviewers answered questions and addressed concerns regarding participation prior to obtaining written informed consent from the parent and written informed assent from the adolescent. After completion of the surveys, cases were weighted for variation in within-household likelihood of selection (in the household sample) and for residual variations between the sample and the US population based on sociodemographic and geographic variables. Additional information on weighting procedures can be located in the NCS-A user guide.^{17, 18} Overall, approximately half of the sample was male (51.3%) with slightly fewer females (48.7%) and the mean age was 15.2 years old. A larger proportion of the sample were youth between the ages of 13 and 14 years old (36.2%) and the remaining age distribution of the sample was relatively equal between youth aged 15 to 16 and 17 to 18 years old. The sample consisted of 65.6% non-Hispanic whites, 15.1% non-Hispanic blacks, and 14.4% Hispanics.

Measures

Assessment of *DSM-IV* Disorders—Adolescents were administered the World Health Organization Composite International Diagnostic Interview (CIDI), a structured interview to determine *DSM-IV* diagnoses, which was modified for administration to adolescents.^{16, 19} Anxiety disorders, behavioral disorders, eating disorders, mood disorders, and substance use disorders were assessed based on lifetime *DSM-IV* criteria and exclusion rules. With the exception of oppositional defiant disorder (ODD) with or without conduct disorder (CD) and substance use disorders (SUD; abuse and dependence), all other diagnoses were made using the *DSM-IV* diagnostic hierarchy rules. The NCS-A used specific evidence-based probing

procedures to improve the participants' recall, which increased reliability in identifying lifetime disorder prevalence.^{20, 21}

Arrests and Offending Variables—Adolescents were asked about their involvement in crimes, and whether or not they led to arrest. The participants were asked whether they “ever had any of the following experiences: 1) Being arrested for a property crime, such as theft or burglary 2) Being arrested for a violent crime, such as assault or armed robbery 3) Being arrested for any other type of crime 4) Committing a property crime, but not getting caught or arrested 5) Committing a violent crime, but not getting caught or arrested 6) Committing any other type of crime, but not getting caught or arrested.” The participants were not asked any additional information about the actual reported crime. When examining arrests with crime, we analyzed data from the entire sample. When examining crimes without arrest, we selected for those who had never been arrested (n=9,397). This was done in to order to study associations between mental illness and crime, differentiating between those who did and did not report involvement with the criminal justice system.

Summary of Analyses—We conducted all analyses using Stata version 13.0.²² All analyses accounted for the survey design using procedures specified in the NCS-A documentation.^{17, 18} We calculated a series of logistic regression models in order to compare the odds of crime outcomes among those with psychiatric disorder to those with no lifetime psychiatric diagnoses. For example, when examining the association between attention=deficit/hyperactivity disorder (ADHD) and arrests for violent crime, we calculated the odds ratio for violent crime, comparing those with a lifetime ADHD diagnosis to those without any lifetime diagnoses. When calculating these estimates, we controlled for age, gender, income, and race/ethnicity. To account for multiple testing, we used a Bonferroni-adjusted significance cut-off of $P \leq 0.00036$. In our second series of models, we examined the odds of committing crime for those with 0, 1, 2, or 3 or more psychiatric diagnoses. Using similar outcomes outlined above, we used logistic regression to calculate these estimates, controlling for age, gender, income, and race/ethnicity. We conducted analyses for the overall sample, and then after excluding those with a CD diagnosis. In our final analyses, we calculated population attributable fractions (PAF) of reporting any crime (with or without arrest), for each category of number of diagnoses. First, we calculated the odds ratios of committing any crime associated with each group, adjusting for age, gender, income, and race/ethnicity. We then converted these odds ratio estimates to relative risks using the following formula: $RR_e = OR_e / [(1 - P_0) + (P_0 * OR_e)]$, where P_0 is the prevalence of the outcome in the non-exposed group (0 diagnoses), OR_e is the odds ratio associated with the exposure, and RR_e is the risk ratio associated with the exposure. Using these relative risks, we calculated population attributable fractions for each category of number of diagnoses using the following formula: $PAF = P_e(RR_e - 1) / [1 + P_e(RR_e - 1)]$, where P_e is the prevalence of the exposure group.

Results

Prevalence estimates for lifetime psychiatric diagnoses and crime outcomes are presented in Table 1. Forty-seven percent of the sample was diagnosed with at least 1 lifetime disorder and 18.4% of the overall sample committed any crime. Arrest for crime was reported by

7.3% of the overall sample, and 10.9% of those who had never been arrested reported having committed a crime. The 3 most prevalent psychiatric diagnoses were social phobia (14.5%), intermittent explosive disorder (14.1%), and major depressive disorder (MDD; 10.8%). Arrests for violent crime were reported by 1.7%, compared to 2.9% arrested for property crimes and 4.0% arrested for other types of crime. Among those never arrested, 1.7% reported ever committing a violent crime, compared to 6.6% for property crime and 7.3% for any other type of crime.

Psychiatric diagnoses and crime resulting in arrest

Table 2 shows odds ratio estimates for each arrest-related crime outcome (property crime, violent crime, and other crime), comparing those with each specific lifetime diagnosis to those with no lifetime diagnosis. With few exceptions, those with psychiatric diagnoses were significantly more likely to report arrest-related crime than those with no diagnosis. CD was most strongly associated with each outcome examined, followed by drug and alcohol use disorders. For example, adolescents with lifetime CD (OR = 57.5) or alcohol use disorders (OR = 19.5) had greater odds of being arrested for a violent crime than those with no diagnosis. Associations between CD and arrest-related crime were stronger among those with comorbid alcohol or drug use disorders than those without these comorbid substance use disorders. Associations between SUDs (alcohol or drug) and arrest-related crime were substantially lower when removing those with CD from the analyses. To a less degree, those with affect, anxiety, and binge eating disorders were also more likely to report being arrested.

Although participants with diagnoses were more likely to report arrest-related crime than those without diagnoses, the majority did not. For example, 79.6% of those with CD, and 92.8% of those with alcohol use disorders reported never being arrested for a violent crime. This pattern was particularly true for those with affect, anxiety, and eating disorders. The large odds ratios in Table 1 were due to comparisons with rates of arrested crime that were near zero among those without psychiatric diagnoses; for example, there was a rate of 0.37% for violent crime arrests in this sub-population.

Psychiatric diagnoses and committed crime without arrests

The pattern of findings for reports of crime among those who reported never being arrested was similar to those presented above for crimes with arrest (see Table 3). Similar to crimes with an arrest, those with diagnoses who were never arrested were substantially more likely to report corresponding crimes. The highest rates of crime were again found among those with a lifetime conduct, or drug or alcohol use disorders. Similar to when examining arrest-related crime, associations between conduct disorder and crime among those not arrested were stronger among respondents with comorbid alcohol or drug use disorders than those without these comorbid SUDs. However, associations between substance use disorders (alcohol or drug) and arrest-related crime did not substantially decrease when removing those with CD from the analyses. The majority of those with psychiatric diagnoses who had never been arrested reported they had never committed a crime (88.2%).

Psychiatric comorbidity and crime outcomes, overall sample

Approximately 21% of the overall sample had 1 psychiatric diagnosis, 10.7% had 2, and 16.1% had 3 or more. Of those with 1 diagnosis, the most common disorders were social phobia (20.1%), intermittent explosive disorder (19.7%), and separation anxiety disorder (SAD; 10.0%). The most common disorders among those with 2 diagnoses were intermittent explosive disorder (28.3%), social phobia (30.0%), and MDD (21.9%). Of those with 3 or more diagnoses, the most common disorders were again social phobia (40.8%), intermittent explosive disorder (43.5%), and MDD (40.8%).

Tables 2 and 3 display associations between psychiatric comorbidity and all crime outcomes. We compared those with 1, 2, and 3 or more diagnoses to those with no diagnoses. Having greater numbers of diagnoses was generally associated with increasingly higher prevalence of crime for all outcomes. For example, those with 1 diagnosis had 6.3 times greater odds of reporting arrest for a violent crime compared to those with no diagnoses, and those with 3 or more diagnoses had 15.7 times greater odds of reporting arrest for a violent crime. Similar patterns were found when examining crime among those who had not been arrested.

Figure 1 displays the proportions of those reporting crime accounted for by each psychiatric comorbidity sub-group. Adolescents with multiple diagnoses accounted for a substantially greater proportion of those reporting crime than would be expected given their population prevalence. For example, those with 3 or more diagnoses made up 16.1% of the population, but accounted for nearly 54% of those reporting violent crimes with an arrest (and 48% of those who had never been arrested and reported violent crime). This was in comparison with those who had no diagnoses, making up approximately 50% of the population but accounting for only 11% of those reporting arrest for a violent crime. Among those with 3 or more diagnoses who were arrested for crime, the 3 most common diagnoses were CD, drug use disorders, and alcohol use disorders. For example, among those with 3 or more diagnoses who reported arrest for violent crime, 84% had CD, 61.7% met criteria for drug use disorders, and 45.8% had alcohol use disorders. The same pattern was found among those committing crime who were never arrested, although the proportions were smaller. For example, among those with 3 or more diagnoses who committed violent crime but were never arrested, 56% had drug use disorders, 45% had alcohol use disorders, and 33% had CD.

Psychiatric comorbidity and crime outcomes, excluding those with CD

Supplemental Tables 1 and 2 (available online) display associations between specific psychiatric diagnoses and crime outcomes, excluding those with a CD diagnosis from the sample. The majority of associations between psychiatric diagnoses and arrest-related crime became non-significant after those with CD were removed from the sample. For example, for violent crime arrest, only associations with agoraphobia and nicotine dependence (without comorbid alcohol or drug abuse) remained significant. For property crime/theft/burglary, only associations with alcohol and drug use disorders remained significant. When examining reports of crime among those never arrested, removing those with a CD diagnosis had less impact on the results. The majority of associations with property crime/theft/

burglary, violent crime, and other crime remained significant. Associations with anxiety disorders were most likely to become non-significant after removing CD, although associations with posttraumatic stress disorder (PTSD) remained significant for all 3 crime outcomes.

Population attributable fractions

Figure 2 displays population attributable fractions (PAF) of committing any crime associated with each number of diagnoses. PAF can be interpreted as the maximum expected reduction in crime that could be expected if each group was no longer included in the population, assuming a fully-causal association. Results are presented both with and without those with CD included in the analyses. Including those with CD, PAF was highest for those with 3 or more diagnoses (43.6%). In total, one could expect a maximum 85.8% reduction in crime if all mental illness were eliminated from US adolescents. Excluding those with CD, one could expect a maximum 67.9% reduction in crime.

Discussion

The NCS-A Supplement was analyzed to examine, for the first time, associations between psychiatric disorders and reported crime involvement among youth with and without arrest history in a nationally representative sample. We found that 18.4% of the sample reported engaging in crime. Of particular note, 10.9% of the sample reported committing crime but never being arrested, which is consistent with existing literature suggesting that most crime goes undetected¹⁴ and highlights the importance of examining this issue among the general population of youth. Overall, the analyses revealed that youth with lifetime externalizing and SUDs were significantly more likely than those without any psychiatric disorders to report involvement in crime. CD, drug use disorders, and alcohol use disorders generally demonstrated greater odds of crime involvement when compared to internalizing disorders such as anxiety and affective disorders. Overall, youth with at least 1 diagnosis committed 85.8% of crime which was reduced to 67.9% by removing those with CD. Our findings also revealed a strong relationship between psychiatric comorbidity and crime, including crimes among those who were never arrested. Youth with 3 or more diagnoses were at highest risk of reported involvement in crime, including violent, property, and other types of crime. However, it is important to note that 88.2% of youth with mental illness reported never committing any crime.

The high rates of crime evidenced in youth with externalizing and SUDs is consistent with the literature demonstrating these youth tend to be impulsive and often fail to consider consequences or merely disregard rules and regulations.⁶ Studies have shown that youth who abuse substances were likely to engage in criminal activities such as property and person offenses to obtain drugs.²⁴ Thus, diverting these youth into substance abuse treatment may prevent these youth from getting involved in crimes that are committed to support their substance use. Also, involvement in drug-related crimes places these youth at higher risk to engage in violence and to become victims of violence.²⁵

Although most delinquency is limited to adolescence,²³ this warrants attention, as CD is an identified risk factor for criminal behavior in adulthood.^{6, 26} It is important to note that

associations between CD and crime are high, as CD represents a collection of behaviors which violate societal norms, and most are criminal offences. Thus criminal activity represents both predictor and outcome in the case of CD and crime. To address this tautology, we removed the effect of CD and continue to find high rates of crime among those with psychiatric diagnosis but without CD diagnosis. Moreover, CD was of particular importance when examining arrests, as most of the associations between psychiatric diagnoses and arrests were no longer significant when those with CD were removed from the sample. However, associations with crime not resulting in arrest mostly remained significant and strong after removing those with CD. This suggests that comorbidity with CD may be less important as a determinant of whether those with psychiatric disorders are more likely to commit crime, but more so important in determining whether crime results in arrest. Given the available data in the NCS-A Supplement, we were unable to determine what may be driving the association between CD and arrest; however, it is possible that youth with CD committed more frequent and/or more serious crimes.

Although internalizing disorders generally had lower associations to crime when compared to externalizing and SUDs, internalizing disorders also conferred significant associations with crime. Both anxiety and affective disorders demonstrate significant associations to crime, and increase risk of arrest.^{6,8} For example, studies have found alarmingly high rates of PTSD in juvenile justice samples,²⁷ but less is known about these rates among youth in community settings who engage in crime.⁶ The current data showed strong associations between crime and internalizing disorders which are consistent with literature suggesting that treating anxiety and affective disorders may be a critical factor in reducing future risk of crime.^{28, 29}

Psychiatric comorbidity resulted in strong associations with crime involvement. Youth with 3 or more psychiatric diagnoses accounted for only 16% of the sample, yet these youth accounted for 54% of those reporting arrest for a violent crime. Among this subsample, CD and drug and alcohol use disorders were disproportionately represented. There has been ample research documenting the high rates of psychiatric comorbidity in detained and correctional juvenile samples.^{7, 8} However, to our knowledge, this is the first study to date to document the high rates of psychiatric comorbidity among youth who commit crime in a nationally representative community-based sample of youth. The findings from this study revealed that many youth with greater psychiatric comorbidity do not necessarily end up in the juvenile justice system. There were substantial numbers of youth with 3 or more diagnoses reporting crime and never having been arrested, highlighting the importance of community-based services designed to engage at-risk youth.

Our findings demonstrate the importance of improving psychiatric and substance use assessment, prevention, and intervention efforts for youthful offenders outside of the juvenile justice system. . Our data revealed that many youth are not arrested for their crimes, particularly for non-violent crimes. For instance, 29% of youth with a drug use diagnosis reported that they committed a property crime and had never been arrested, yet only 13% of youth with this diagnosis reported being arrested for committing a property crime. Therefore, useful strategies may include expanding early detection of psychiatric disorders as well as school and/or community-based services for youth.

Studies have already also shown a significant relationship between persistent drug use and persistent delinquency³⁰ and juvenile crime and psychiatric comorbidity. Although Moffitt²³ argued that the majority of youth are adolescence-limited offenders, there is considerable value in identifying youth who will become life-course persistent offenders due to their psychiatric illness including addiction.³¹ Improving access to treatment can be instrumental in breaking a link in the pathway from juvenile delinquency to adult offending. Proper identification of youth for whom offending is related to their substance use and/or psychiatric illness is crucial because it allows them to receive appropriate treatment. Also, providing interventions to those who do not need it may be unnecessary or may even have criminogenic effects.³⁰ Our findings echo the need to treat delinquency not with punitive sanctions but rather through greater emphasis on psychiatric and substance use prevention programs and interventions.³² Youth who receive treatment are at lower risk for subsequent incarceration,³¹ and community-based services as well as diversion programs can provide effective treatment without compromising public safety.³² Furthermore, CD does not inevitably lead to adult offending, and there are several interventions documented in the literature which are promising in the treatment of behavioral disorders among community-based and justice-involved youth.^{33, 34}

There are several limitations to this study. First, criminal involvement was based entirely on youth self-report and was not supplemented with official crime data. Youth may under-report their criminal involvement. However, studies have shown that adolescents accurately report delinquent involvement and, although not perfect, self-report is a more comprehensive measure of the true extent of delinquency.^{14, 30, 35, 36} Self-report can capture adolescents not included in crime statistics, including many adolescents who are not arrested for their involvement in illegal behaviors and thus fail to come into contact with the juvenile justice system.^{14, 30, 35, 36} Moreover, experts argue that we need more studies about the psychiatric needs of youth who commit crimes but do not come to the attention of the authorities.⁶ Consistent with existing literature arguing that most youth are not arrested for their delinquent behavior, our data revealed that the percentages of youth reporting involvement in crime not resulting in arrest was higher than the percentages of youth reporting being arrested for those same crimes, with the exception of violent crime. The CIDI only questions the respondent about dependence when criteria for abuse is met which may lead to under-diagnosing alcohol and/or drug dependence in the absence of abuse.³⁷ There were no follow up questions for the youth to specify their actual crimes which may have distinguished severity of offenses within categories. Furthermore, there was no specification of the types of crime which fell in the “any other crime” category, and having this information may have allowed for further elucidation of the higher percentages seen in this category. Because drug use is a crime, the high percentages of youth with SUDs in the “any other crime” category may have been for drug-related arrests such as selling or possession of narcotics. In addition, the dataset did not include information about any of the developmental disorders or psychotic spectrum disorders, both of which are associated with increased risk for crime.³⁵

It is possible that youth with mental illness may have been less inhibited and consequently more likely or willing to report criminal involvement. However, our data shows that for all diagnostic categories, despite higher rates of reporting crime involvement among mentally

ill youth, the majority of youth with psychiatric disorders reported no criminal involvement at all. Also, the cross-sectional nature of this design does not allow us to evaluate whether psychiatric disorders preceded crime involvement. Using a longitudinal design with a nationally representative sample would help clarify the time course of the relationship between psychiatric disorders and crime in youth.

Despite these limitations, our results revealed that youth with psychiatric disorders and more psychiatric comorbidity were significantly more likely to report involvement in arrest-related violent and non-violent crimes. This same pattern was evident for reported involvement in violent and non-violent crimes among those who were never arrested. Most of the literature on psychiatric disorders and crime among youth are based on juvenile justice samples but as previously noted, many crimes go unreported or undetected. The current study demonstrates that even among youth who have not been involved in the criminal justice system, those with psychiatric disorders are disproportionately involved in crime, suggesting the need for improving access to community-based mental health services.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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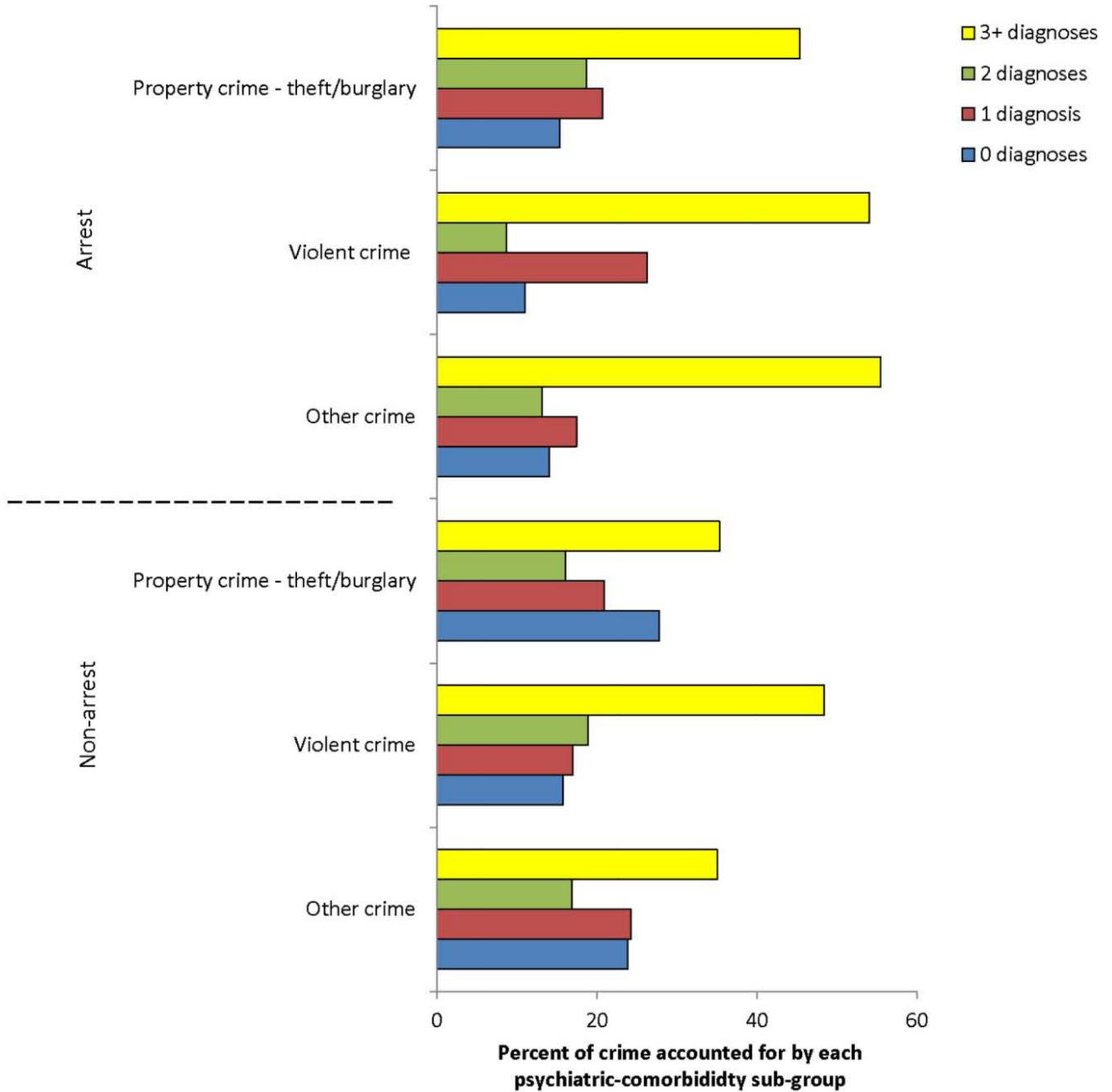


Figure 1.

Percentages of crime accounted for by those with varying numbers of psychiatric diagnoses, relative to population prevalence. Note: Estimates were calculated using logistic regression, accounting for the survey design. Results showed that despite making up a smaller portion of the total population, adolescents with substantial psychiatric comorbidity accounted for a much larger portion of reported crime. For example, those with no psychiatric diagnoses made up over 50% of the population, and accounted for 15.8% of those never arrested who committed violent crime, whereas those with 3 or more diagnoses made up only 16.0% of

the population, and accounted for 48.4% of those never arrested who committed violent crime.

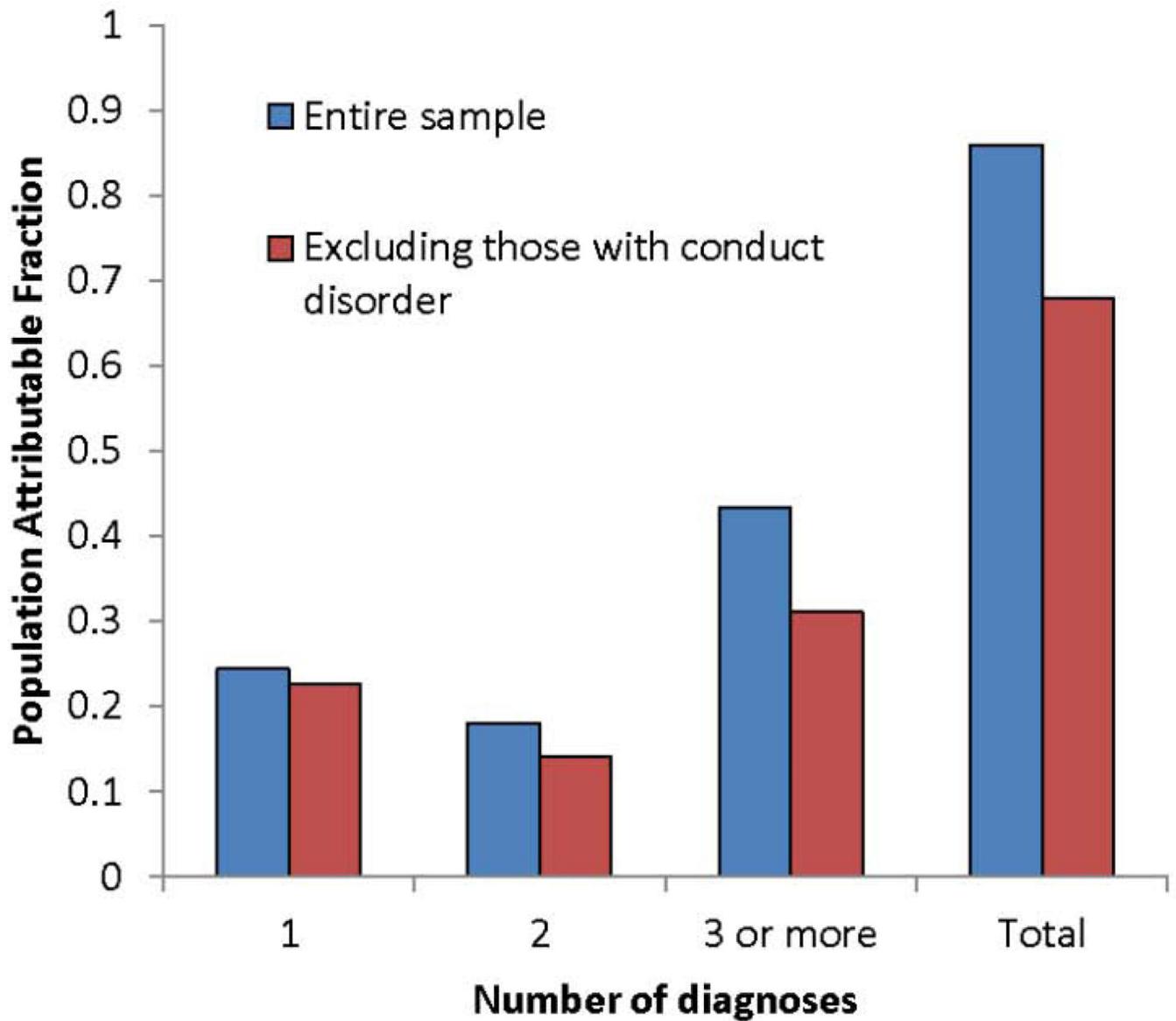


Figure 2.

Population attributable fraction (PAF) of those who committed any crime, by number of diagnoses. Note: results are presented both with and without those with conduct disorder (CD) included in the sample. One could expect up to 86% of crime to be reduced if there were no mental illness (68% when those with CD were eliminated from the sample). PAF calculated using the following formula: $PAF = P_e(RR_e - 1) / [1 + P_e(RR_e - 1)]$, where P_e is the prevalence of the exposure group and RR_e is the relative risk associated with the exposure group. To obtain RR_e , odds ratios were calculated using logistic regression, accounting for the survey design and adjusting for income, age, gender, and race/ethnicity. These odds ratios (OR_e) were then converted to RR_e using the following formula: $RR_e = OR_e / [(1 - P_0) + (P_0 * OR_e)]$, where P_0 is the prevalence of the outcome in the non-exposed group (0 diagnoses).

Table 1

Frequencies for Specific Disorders, Psychiatric Comorbidity Subgroups, and Crime Outcomes (N = 10,123).

	Total sample (N = 10,123)	
	<i>n</i>	%
Attention/Disruptive Behavior/Impulse Control Disorders		
ADHD	432	4.15
CD	586	5.44
Without alcohol or Drug abuse	278	2.65
With alcohol or drug Abuse	308	2.79
IED	1,389	14.09
ODD	1,047	10.14
Affective Disorders		
Bipolar (I or II)	231	2.27
Dysthymia	335	0.34
MDD	1,123	10.82
Anxiety Disorders		
Agoraphobia	293	2.66
GAD	298	3.19
Panic Disorder	238	2.35
PTSD	388	4.01
SAD	772	7.63
Social Phobia	1,434	14.46
Eating Disorders		
Any Binge Disorder	532	4.95
SUDs^a		
Alcohol Use Disorders	678	6.43
Drug Use Disorders	880	8.93
Nicotine Dependence	713	7.04
Number of diagnoses		
0	5,402	52.6
1	2,009	20.6
2	1,110	10.9
3+	1,627	15.96
Crime		
Arrested		
Property/theft/burglary	281	2.89
Violent	175	1.74
Other	420	4.03
Never Arrested^b		

	Total sample (N = 10,123)	
	<i>n</i>	%
Property/theft/burglary	621	6.55
Violent	185	1.71
Other	671	7.29

Note: Percentages accounted for the survey design. The listed diagnoses are lifetime prevalence. ADHD = attention-deficit/hyperactivity disorder; CD = conduct disorder; GAD = Generalized anxiety disorder; IED = intermittent explosive disorder; MDD = major depressive disorder; ODD = oppositional defiant disorder; PTSD = posttraumatic stress disorder, SAD = separation anxiety disorder; SUDs = substance use disorders.

^a Alcohol Use Disorders (Abuse+Dependence); Drug Use Disorders (Abuse+Dependence-note the Composite International Diagnostic Interview [CIDI] skip patterns do not assess dependence in the absence of abuse); Nicotine Dependence (without alcohol or drug use disorder).

^b
n=9,397

Table 2

Prevalence and Odds Ratios for Crimes With Arrest Based on Specific Diagnoses (N = 10,123)

Diagnosis ^a	Property Crime-Theft/Burglary Arrest			Violent Crime Arrest			Any Other Crime Arrest		
	%	OR	95% CI	%	OR	95% CI	%	OR	95% CI
No Lifetime Disorder	0.84	Ref.	---	0.37	Ref.	---	1.08	---	Ref.
Attention/Disruptive Behavior/Impulse CDs									
ADHD	4.84	4.96*	[2.58, 9.54]	6.80	18.49*	[8.80, 38.85]	10.47	9.54*	[5.67, 16.05]
CD	22.70	30.65*	[17.02, 55.18]	20.42	57.47*	[30.35, 108.82]	34.11	38.21*	[22.71, 64.28]
Without alcohol or drug use disorder	19.84	25.93*	[12.30, 54.67]	20.59	49.05*	[23.88, 100.76]	22.47	20.24*	[9.73, 42.09]
With alcohol or drug use disorder	25.19	35.18*	[17.43, 71.02]	20.25	61.67*	[32.19, 118.13]	45.19	54.74*	[31.62, 94.77]
IED	5.30	6.17*	[3.25, 11.70]	4.29	11.00*	[5.73, 21.11]	9.81	8.80*	[5.56, 13.91]
ODD	6.36	7.55*	[4.56, 12.49]	4.54	11.80*	[6.88, 20.23]	12.96	12.67*	[7.34, 21.89]
Affective Disorders									
Bipolar (I or II)	11.70	17.17*	[7.49, 39.34]	4.45	11.60*	[5.46, 24.67]	8.16	7.02*	[3.10, 15.92]
Dysthymia	4.03	6.25*	[2.83, 13.82]	5.16	16.91*	[8.88, 32.22]	10.19	11.17*	[5.37, 23.22]
MDD	4.63	6.50*	[3.91, 10.80]	2.90	9.53*	[5.13, 17.70]	7.60	7.84*	[4.43, 13.86]
Anxiety Disorders									
Agoraphobia ^b	0.86	1.33	[0.44, 4.04]	5.72	18.91*	[5.57, 64.15]	4.91	5.46*	[3.16, 9.41]
GAD	5.53	9.73*	[4.86, 19.48]	1.56	4.66*	[2.05, 10.59]	5.94	6.35*	[3.27, 12.38]
Panic Disorder	5.27	4.96*	[2.33, 10.59]	2.69	6.28*	[2.64, 14.92]	5.28	4.78	[1.69, 13.58]
PTSD	3.94	7.88*	[3.89, 15.97]	2.92	11.76*	[5.68, 24.33]	9.51	14.15*	[7.12, 28.13]
SAD	2.56	3.34	[1.52, 7.32]	2.82	8.57*	[3.86, 19.01]	4.76	4.71*	[2.88, 7.70]
Social Phobia	4.41	5.45	[2.34, 12.67]	2.31	6.99*	[3.31, 14.75]	5.68	5.46*	[3.54, 8.42]
Eating Disorders									
Any Binge Disorder									

Diagnosis ^a	Property Crime-Theft/Burglary Arrest	Violent Crime Arrest	Any Other Crime Arrest
SUDs^c			
Alcohol Use Disorder	3.71 [2.13, 11.94]	3.43 [3.21, 27.66]	5.38 [3.28, 8.66]
Drug Use Disorder	13.06 [18.94*]	7.25 [19.47*]	21.65 [13.08, 28.83]
Nicotine Dependence	13.40 [18.62*]	6.24 [16.06*]	20.93 [11.68, 29.42]
	7.76 [12.19]	6.09 [15.55*]	9.33 [4.83, 17.98]
Number of diagnoses			
0	0.84 Ref.	0.36 Ref.	1.08 Ref.
1	2.91 [3.56*]	2.22 [6.26*]	3.42 [1.81, 5.40]
2	4.94 [6.32*]	1.39 [3.59]	4.85 [2.59, 6.99]
3+	8.19 [10.49*]	5.88 [16.07*]	13.97 [8.63, 20.39]

Note. All estimates accounted for the survey design. Estimates were adjusted for income, age, gender, and race/ethnicity. ADHD = attention-deficit/hyperactivity disorder; CD = conduct disorder; GAD = generalized anxiety disorder; IED = intermittent explosive disorder; MDD = major depressive disorder; ODD = oppositional defiant disorder; OR = odds ratio, calculated using logistic regression; PTSD = posttraumatic stress disorder; SAD = separation anxiety disorder; SUDs = substance use disorder.

^aThe listed diagnoses are lifetime prevalence.

^bAgoraphobia with/without panic disorder.

^cAlcohol Use Disorders (Abuse+Dependence); Drug Use Disorders (Abuse+Dependence); note the Composite International Diagnostic Interview [CIDI] skip patterns do not assess dependence in the absence of abuse); Nicotine Dependence (without alcohol or drug use disorder).

* $p \leq 0.00036$ (Bonferroni adjusted p -value)

Diagnosis ^a	Commit Property Crime- Theft/Burglary; Not Arrested	Committed Violent Crime; Not Arrested	Committed Any Other Crime; Not Arrested
SUDs^c			
Alcohol Use Disorder	25.84 9.45* [5.53, 16.21]	9.93 28.06* [11.48, 68.57]	35.13 14.41* [9.42, 22.06]
Drug Use Disorder	28.65 11.38* [7.55, 17.15]	11.29 28.22* [14.23, 55.95]	34.07 14.47* [10.60, 19.76]
Nicotine Dependence	11.23 3.41 [1.36, 8.56]	3.82 12.07* [4.36, 33.43]	11.02 3.78* [2.01, 7.12]
Number of diagnoses			
0	3.28 Ref. ---	0.49 Ref. ---	3.13 Ref. ---
1	6.66 2.11 [1.30, 3.43]	1.41 3.00 [1.26, 7.12]	8.63 2.89* [2.00, 4.19]
2	9.96 3.25* [2.32, 4.56]	3.06 6.45* [3.00, 13.85]	11.61 3.98* [2.65, 6.00]
3+	17.27 6.56* [4.80, 8.96]	6.19 13.54* [7.68, 24.78]	19.05 7.56* [5.37, 10.64]

Note. All estimates accounted for the survey design. Estimates were adjusted for income, age, gender, and race/ethnicity. ADHD = attention-deficit/hyperactivity disorder; CD = conduct disorder; GAD = generalized anxiety disorder; IED = intermittent explosive disorder; MDD = major depressive disorder; ODD = oppositional defiant disorder; OR = odds ratio, calculated using logistic regression; PTSD = posttraumatic stress disorder; SAD = separation anxiety disorder; SUDs = substance use disorders.

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