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ORIGINAL ARTICLE

Investigating Factors Related to Criminal Behavior in Adolescents with Substance Use

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Main Points

- There is a strong relationship between delinquent behaviors and substance use in adolescents.
- Males who use drugs are more likely to commit crimes than females.
- School appears to be a protective factor against substance use and criminal behaviors.
- Attention should be given to adolescents with weak parental control and a family history of delinquency.
- Self-harming behavior may be predictive of environmental harm behavior.

Abstract

There is a strong relation between substance use and criminal behavior. In this study, we aimed to identify the factors that predict the relationship between these two concepts. A total of 197 patients who were admitted to the Child and Adolescent Treatment Center between 2018 and 2019 were included in the study. Cases were divided into two groups based on their criminal behaviors. A model was set up to evaluate factors that affect criminal behavior and this model was analyzed by using the logistic regression method. The following factors increased criminal behavior: male gender 29.2 times (odds ratio = 29.249), self-harm behavior 3.2 times (odds ratio = 3.291), criminal history in family 3.1 times (odds ratio = 3.137), spending more than a month outside of the home without family supervision 6.5 times (odds ratio = 6.549), not attending school 20 times (odds ratio = 0.054), and ecstasy use 8.2 times (odds ratio = 8.273). This study identifies several risk factors associated with the criminal behaviors of substance-abusing adolescents. This study can contribute to prevention and rehabilitation studies in the field.

Keywords: Adolescence, criminal behavior, delinquency, MDMA, parenting control, substance use disorder

Introduction

Substance use disorder (SUD) in adolescents is a public health problem. Substance use disorder, if not treated timely, may lead to important negative outcomes. Social situations such as low academic success, comorbid psychological disorders, accidents, infections such as human immunodeficiency virus/acquired immunodeficiency syndrome, adversely affected family life, financial losses, violence, and delinquency are negative outcomes of SUD in adolescents (Crowe, 1998).

The adolescence period on its own is a risk factor for SUD. In this period, the prefrontal cortex (PFC) is not yet fully developed. The PFC has critical roles such as impulse control and decision-making. Late maturation of the PFC increases predisposition to risky behaviors such as substance use and delinquency (Akyel et al., 2018).

There is a strong relationship between substance use and criminal behavior. It is considered that these two behaviors etiologically share common sociological, environmental, and psychological factors. Arrest, detention, or encountering the judicial system in a different way are the final consequences that substance-abusing adolescents can face. Substance use generally causes trouble in school and family relations. This may result in participating in negative peer groups, alienation from social support systems, and being subjected to abuse.

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There is a bidirectional relationship between substance use and delinquency. When substance use predisposes an individual to delinquency, he/she can commit a crime to obtain a substance. However, it is difficult to know which problem started first (Anderberg et al., 2022; Saladino et al., 2021).

The relationship between substance use and criminal behavior is explained with three different models: psychopharmacological, economic requirement, and systemic. According to the psychopharmacological model, substance use leads to an increase in excitement, irrational behaviors, energy boost, and changes in consciousness. This results in loss of control and increases predisposition to crime-related behaviors. As reported by the economic requirement model, to attain substance, extortion, stealing, injury, homicide, prostitution, and other crimes can be committed. The systemic model emphasizes that crimes are committed because of the production, trafficking, and trade of substances. These crimes include rival gangs, dealer robberies, sale of substances, and disagreements. Another theory states that crime leads to substance use. According to this theory, substance use is observed because people who have crime-related experiences are prone to get included in the substance using social environments and subcultures (Atlam & DŞ, n.d.; Goldstein, 1985; White & Gorman, 2000).

In a study performed in the United States of America, the incidence rate of substance-related and other crimes was 83% in substance-abusing adolescents. The committed crimes are distributed as follows: property crime (vandalism, forgery, stealing), attack on people (assault, injury, rape, murder, arson), and substance-related crimes (trading, drug-impaired driving) (Dennis et al., 2004).

Crime associated with substance use increases stigma and results in social exclusion. Adolescents with criminal behaviors are considered to differentiate from the group (without criminal behavior) in terms of substance use and sociodemographic characteristics. Identifying factors related to criminal behaviors in adolescents with SUD can guide prevention, treatment, and rehabilitation studies. Therefore, this study aimed to investigate criminal behaviors in adolescents with SUD diagnosis and to examine factors related to this behavior.

Material and Methods

Sample

This was a retrospective cross-sectional study. Its sample consisted of 197 adolescents who were admitted to the Child and Adolescent Treatment Center in the Diyarbakır Selahattin Eyyubi State Hospital between 2018 and 2019. All patients who were admitted between the specified dates were included in the study. Because there were no cases with missing data, all cases were included in the analysis. File information contains self-reports of cases and families.

Procedure

Approval was obtained from the Non-Interventional Studies Ethics Committee within the Health Sciences University Diyarbakır Gazi Yaşargil Training and Research Hospital. This study was specified as a substudy with the ethics committee's decision dated June 28, 2019, and numbered 310. Informed consent was obtained from the participants and their parents. The "criminal behavior" of cases was questioned as "having judicial history" in the evaluation file. Cases who encountered the judicial system as a victim were not included in the study. The cases were divided into two groups: "with criminal behavior" and "without criminal behavior." Criminal behaviors were divided into three groups: stealing, injury, and substance-related behaviors. Only substance-related crimes were involved in probation. To determine socioeconomic status, the minimum wage on the relevant date was used as a base. Substance-related diagnoses and attention deficit and hyperactivity disorder (ADHD) diagnoses of the cases were evaluated according to the Diagnostic and Statistical Manual of Mental Disorders (DSM)-5. At the diagnostic level, all substances' past and ongoing use experiences were recorded. Information about the number of days the cases spent outside the home without the supervision of the family was taken from the family and the adolescent himself, being recorded as a numerical value and two categories formed as "less than 30 days" and "more than 30 days."

Statistical Methods

The study data were evaluated with the Statistical Package for the Social Sciences version 23.0 for Windows software (IBM SPSS Corp.; Armonk, NY, USA). The normality assumption was evaluated by using the Shapiro–Wilk test for normality. Categorical variables are presented as *n* (%), while numeric variables are reported as the means and standard deviations. The cases were separated into two groups according to the presence of criminal behaviors. Based on the relevant literature, a model was set to determine the factors affecting the criminal behaviors of the cases. The following variables were included in the model created: age, gender, suicide attempt, socioeconomic status, criminal history in the family, employment history, categorical number of days outside the home without the supervision of family, ADHD diagnosis, school attendance, disciplinary action history, alcohol, ecstasy, methamphetamine, opiate use, and starting age of tobacco and cannabis. Logistic regression analysis was used to test the model. To show the significance level of the findings, the *p*-value was input directly.

Results

The sample consisted of 197 cases, 23 (11.7%) girls and 174 (88.3%) boys. The mean age and education time of the samples were 16.3 $\pm$ 1.1 and 7.6 $\pm$ 1.9, respectively. A total of 164 (82.6%) people were not attending school, and 93 (47.2%) had a hospitalization history. Judicial history distribution was as follows: stealing 21 (10.7%) persons, injury 56 (28.5%) persons, substance-related 35 (17.8%) persons. Probation of 30 (15.2%) people still continues due to substance use. Sociodemographic and clinical characteristics are presented in detail in Table 1.

When the groups were compared, the following factors increased criminal behavior: male gender 29.2 times (OR = 29.249; 95% confidence interval (CI) 3.054 – 280.163), self-harm behavior (SHB) 3.2 times (OR = 3.291; 95% CI 1.081 – 10.022), criminal history in family 3.1 times (OR = 3.137; 95% CI 1.035 – 9.509), spending more than a month outside the home without the supervision of family 6.5 times (OR = 6.549; 95% CI 1.821 – 23.549), not attending school 20 times (OR = 0.054; 95% CI 0.004 – 0.677), and ecstasy use 8.2 times (OR = 8.273; 95% CI 2.181 – 31.383). Data comparing variables based on criminal behavior are shown in Table 2.

Table 1.
Sociodemographic and Clinical Characteristics of the Sample

Variables		N/ Mean	%/ SD
Age		16.3	1.1
Gender	Female	23	11.7
	Male	174	88.3
School attendance	Yes	29	15.3
	No	164	82.6
Admission history	Absent	102	51.8
	Present	93	47.2
Education time		7.6	1.9
Judicial history type	Stealing	21	10.7
	Injury	56	28.5
	Substance-related	35	17.8
Probation		30	15.2
Substance-related diagnosis	More than one SUD	81	41.1
	Opiate UD	69	35
	Cannabis UD	28	14.2
	Ecstasy UD	2	1
	Inhalants UD	7	3.6
Substance use history	Tobacco	189	95.9
	Alcohol	156	79.2
	Cannabis	174	88.3
	Ecstasy	132	67
	Heroin	105	53.3
	Methamphetamine	79	40.1
	Synthetic cannabinoids	39	19.8
	Inhalants	74	37.6
Starting age	Tobacco	11.3	2.2
	Alcohol	14.4	1.6
	Cannabis	13.7	1.9
	Ecstasy	14.4	1.4
	Heroin	15	1.3
	Methamphetamine	15.5	1.1
	Synthetic cannabinoids	15	1.5
	Inhalants	13.2	2

Note: SD = Standard deviation; UD = Use disorder.

Discussion

This study aimed to examine the factors related to the criminal behavior of adolescents with SUD. At the end of the study, male gender, SHB, not attending school, criminal history in family, spending more than a month outside the home without parenting supervision, and ecstasy use were associated with delinquency (Table 2).

The Edinburg Youth Study evaluating criminal behavior and the judicial system in adolescents reported that being an adolescent and young adult male is a risk factor for criminal behavior (McAra & McVie, 2010). A follow-up study investigating the effect of gender on the substance use behavior of adolescents found that boys have more legal trouble than girls. It also showed that legal trouble presence in girls is a predictor of deprivation (Hsieh & Hollister, 2004). A similar study was performed in Australia with 1000 young people, suggesting that women use substances just as much as men and have more psychosocial problems; however, men commit more crimes (Mitchell et al., 2016). Contrary to these studies, another study reported that young adult men and women have similar criminal rates (Dean et al., 2010). Our study is supported by the literature in general. Studies continuously recorded higher crime rates in men than in women. Gender differences in social cognition development may contribute to explaining this situation. How an individual reacts to stressful life events depends on his cognitive processes. Social knowledge processing skills allow the individual to encode information, to interpret and consider the risks and benefits of a particular action, and to respond appropriately based on the behavioral scenario repertoire. It is known that women acquire social and cognitive skills at an earlier age and have better social skills than men. Some characteristics of the female gender, such as better interhemispheric communication, less frontal lobe deficiency, more verbal skills, and more socialization contribute to better social skills (Bennett et al., 2005). The low number of female patients in the sample makes it difficult to carry out a definitive assessment on this matter. Adolescent girls with a history of crime and substance use that requires inpatient treatment may be part of a subgroup that does not even come to detoxification treatment due to more family and peer problems.

Self-harm behavior is a self-damaging action that occurs through the destruction of body tissue, ingestion of toxic substances, or other deliberate practices. Individuals with SHB also harm others (Sahlin et al., 2017). Identifying early antecedents associated with delinquency in these individuals is important in terms of developing early prevention strategies. Besides, after being included in the judicial system, violence offenders begin to show SHBs as well (Laporte et al., 2017). A systematic review encompassing 123 studies demonstrated a positive relationship between aggression and SHB (O'Donnell et al., 2015). A study evaluating the relation between SHB and dual harm (both self-harm and violence against others) found a significant relationship between self-harm and dual harm. Low IQ (Intelligence Quotient) and low self-control, substance abuse, and psychotic symptoms increase dual harm risk (Richmond-Rakerd et al., 2019). Studies in the literature generally analyze the relationship between SHB and violent crime. In our study, the association between crime type and SHB was not examined, and judicial history was generally evaluated. Nevertheless, it is not considered that crime types can be independent of each other. In an extensive sampling study evaluating the relationship between risky behaviors and substance use, this relationship was confirmed, suggesting that one risky behavior is an antecedent of another one (Havaceligi Atlam et al., 2017).

School is the main place of academic and social life for young people. The academic development of adolescents who are not attending school is interrupted and their social relations decrease over time. All studies in this field concluded that school is a preventive factor in terms of SUD. In a study assessing the prognosis of SUD, school attendance is associated with a good prognosis

Table 2.
Evaluation of Criminal Behavior with Logistic Regression Analysis

Variables		Criminal Behavior			
		Present (N = 104)	Absent (N = 90)	p	OR (95% Confidence Interval)
Gender	Female	11	10		1.000
	Male	93	80	**.003**	29.249 (3.054 – 280.163)
Suicide attempt	Yes	78	76		1.000
	No	26	16	.915	0.926 (0.227 – 3.781)
Self-harm	No	42	57		1.000
	Yes	62	33	**.036**	3.291 (1.081 – 10.022)
Criminal history in family	No	42	48		1.000
	Yes	60	41	**.043**	3.137 (1.035 – 9.509)
Household income	Below MW	52	42		1.000
	MW	32	27	.628	0.759 (0.249 – 2.311)
	Above MW	11	12	.538	0.599 (0.117 – 3.069)
Employment	No	78	70		1.000
	Yes	26	20	.079	0.321 (0.090 – 1.138)
Days outside the home	<30	56	65		1.000
	>30	48	25	**.004**	6.549 (1.821 – 23.549)
ADHD	No	15	18		1.000
	Yes	45	46	.846	1.154 (0.271 – 4.919)
School	Continuing	10	19		1.000
	Not continuing	89	64	**.024**	0.054 (0.004 – 0.677)
Discipline	No	20	22		1.000
	Yes	72	58	.263	0.502 (0.151 – 1.675)
Alcohol	No	18	22		1.000
	Yes	86	68	.260	0.371 (0.066 – 2.085)
Ecstasy	No	20	43		1.000
	Yes	83	46	**.002**	8.273 (2.181 – 31.383)
Opiate	No	43	45		1.000
	Yes	61	44	.679	0.792 (0.263 – 2.385)
Methamphetamine	No	60	54		1.000
	Yes	44	34	.528	0.711 (0.246 – 2.052)
Age				.631	1.137 (0.674 – 1.917)
Tobacco SA				.240	1.166 (0.902 – 1.507)
Cannabis SA				.217	0.821 (0.601 – 1.123)

Note: χ^2 = 117.891; p = .001; Nagelkerke R^2 = 0.472.
ADHD = Attention-deficit and hyperactivity disorder; MW = Minimum wage; OR = Odds ratio; SA = Starting age.

(Kayış et al., 2019). Failure in school and weak ties with school increase the likelihood of both situations (Bäckman et al., 2014; Gauffin et al., 2015). A 1-year follow-up study performed in Sweden demonstrated that the presence of school-related problems increased delinquency nearly two times in substance-abusing adolescents (Anderberg et al., 2022). Our study complies with the literature in this respect.

In adolescence, the relationship between criminal behavior and substance use to the family can take several forms. Family, as a role model, may lead adolescents to commit crime or to use substances (Bülbül & Doğan, 2016). Psychopathologies associated with crime and substance use or the substance use itself may be genetically inherited. For instance, one study discovered that criminal behavior is transmitted between generations although other risk factors are controlled (Farrington et al., 2009). As a result of insufficient parental supervision, adolescents may be at risk for substance use and delinquency. In a study including more than 3000 high school students, parental behavior control was inversely related to the criminal behavior of adolescents

(Zhu & Shek, 2021). Substance use and criminal behavior may include common familial etiological factors. Consequently, it is difficult to talk about one-way relationships. Negative family structure, low parental education status, low socioeconomic status, substance use, and crime in the family are significant risk factors for adolescent delinquency (Atlam & DŞ, n.d.). In a study including 8587 adolescents, high rates of alcohol substance use and criminal history were found in the parents of the crime-involved adolescents (Bright & Jonson-Reid, 2015). There is evidence supporting that intense conflicts with parents or siblings, substance use, and crime history in the family lead to delinquency and substance use in young people (Cheng & Lo, 2011; Stone et al., 2012). In a review encompassing 61 articles that examined the link between problematic family relationships, substance use, and delinquency, the criminal involvement of parents, the absence of parents, weak family control, and interaction predispose adolescents to substance use and delinquency (Saladino et al., 2021).

Adolescence is a period under the effect of impulsivity; a search for autonomy, risky behaviors, and refusing parental supervision can be seen in this period. However, the need for parental supervision is very high in such a period. When familial risk factors related to substance use are examined, neglectful, overly permissive and authoritarian parental attitudes, weak family bonds, low conflict resolution, and allocating responsibility skills are encountered (Ogel, 2010). Our study found that spending a long time outside the home as a result of insufficient parental supervision is associated with adolescent delinquency. In a compilation study investigating the relationship between substance use and crime in adolescents, psychosocial risk factors associated with crime were defined in a similar way (Atlam & DŞ, n.d.).

Violent behaviors are higher among people who abuse alcohol and other psychoactive substances (Boles & Miotto, 2003). The occurrence of violent behavior differs according to the biological structure of the substance and the person using it. Generally, these substances operate by inhibiting the behavior control center of the brain. In studies, numerous psychoactive substances are associated with crime (Atlam & DŞ, n.d.).

In a study evaluating urine toxicology of young adults who were admitted to emergency services as a result of violent crimes, the most detected substances other than alcohol were cannabis and cocaine (Liakoni et al., 2018). The method (urine analysis) and age gap (adult sample) of the indicated study was different from our study. The residence time of the stimulants in the urine is low; therefore, these substances may not be detected. In a study conducted with adolescents and examining substance-related crimes, weekly stimulant use, distant relation with father, lying, stealing, and medium-/high-level nicotine use were the most powerful predictors of crime (Kontu et al., 2021).

Ecstasy, chemical name 3,4-methylene-dioxy-methamphetamine (MDMA), is an amphetamine derivative. Its effects are similar to both amphetamines and hallucinogens. The effect of ecstasy manifests 20 – 60 minutes after it is taken and continues for 4 – 6 hours. Its ultimate effect is that it is a powerful stimulant. While giving the sense of increased energy, it blocks the sense of sleep and fatigue. Amphetamine causes psychological and physical attitude changes such as exaggerated pleasure, loss of appetite, decreased need for sleep, uneasiness, nausea, agitation, increased blood pressure and body temperature, increased heart rate, and uniform behaviors (Demirci Çiftçi, 2016). Based on these effects of ecstasy, a study performed to assess the relationship between substance use and sensation-seeking behavior in adolescents reported that ecstasy was the substance most frequently associated with sensation-seeking. Previous studies have also associated sensation-seeking behavior with criminal behavior (Martins et al., 2008). In the literature, there is only one study that included adolescent criminals and approached ecstasy use from a developmental perspective. In this study, ecstasy use in adolescent criminals was significantly higher than in other groups. Furthermore, the indicated study underlined that ecstasy use and delinquency share common risk factors. The ongoing use of ecstasy in the developmental period complicates the problem (Wojciechowski, 2018). A study investigated the relationship between MDMA and crime. It reported that when other substance uses, psychopathologies, and sociodemographic risk factors were controlled, violent and nonviolent criminal behaviors were more frequent in MDMA users than in nonusers (Vaughn et al., 2015). The number of studies examining the relationship between ecstasy use and criminal behavior is limited in the literature. Our study supports the observations showing this relationship. However, we could not find a significant relationship for substances other than ecstasy. This shows that the link between substance and crime can be complicated, and apart from the characteristics of the substance, it can be affected by other factors (such as frequency of usage and age). Data on substance use in our study were based on self-reports. The frequent use of multiple substances may also affect the results.

Limitations and Directions/Suggestions for Future Research

Consequently, this study found that delinquency is significantly related to male gender, self-harming behavior, not attending school, criminal history in family, low parental supervision, and ecstasy use. Adolescents with additional delinquent behavior to substance use and adolescents with only substance use differ from each other. It is recommended to take notice of identified risk factors in prevention and rehabilitation programs. Our study had some limitations including the following: it did not include psychopathologies, it was retrospectively, delinquency behaviors were not analyzed in detail, the relationship between crime type and substance type was not examined, and data relied on self-reports. Our study can contribute to the limited literature in this field. There is a need for prospective, extensive sampling, controlled studies including other risk factors.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of University of Health Sciences Diyarbakır Gazi Yaşargil Training and Research Hospital (Approval No: 310, Date: June 28, 2019).

Informed Consent: Informed consent was obtained from the participants and their parents who agreed to take part in the study.

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