



High prevalence of nonsuicidal self-injury, tattoos, and psychiatric comorbidity among male adolescent prisoners and their sociodemographic characteristics



Mehmet Fatih Ceylan, Selma Tural Hesapcioglu, Meryem Kasak, Cansu Pınar Yavas

Ankara Yıldırım Beyazıt University, Faculty of Medicine, Child and Adolescent Psychiatry Department, 06306, Ankara, Turkey

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ABSTRACT

Background: This study investigates the frequency of psychiatric disorders and the sociodemographic and clinical features in adolescent prisoners.

Method: The psychiatric diagnoses and sociodemographic characteristics of treatment of 76 adolescent male prisoners and 76 age-matched patients were compared (age range: 15–17).

Results: Conduct disorder (85.5%), attention deficit hyperactivity disorder (61.8%), depression (50%), substance abuse (40.8%), post-traumatic stress disorder (19.7%), and psychotic disorder (3.9%) were more frequent among adolescent prisoners than the control group. The educational levels of parents of adolescent prisoners and their socioeconomic statuses were significantly lower, and the nonsuicidal self-injury (73.7%) and tattooing frequency (65.8%) were significantly higher among adolescent prisoners than the control group. Only 51.3% had both parents living together.

Conclusion: Psychiatric disorders, low socioeconomic status, family disorganization, nonsuicidal self-injury, tattoos, and interruption of education were frequent in adolescent prisoners in this study. Our findings emphasize the importance of early psychiatric treatment and family-based interventions to help prevent adolescents from committing crimes. In addition, nonsuicidal self-injury and tattoos may be associated with criminal behavior in adolescents.

1. Introduction

The prevalence of psychiatric disorders among adolescent prisoners has been reported in the past 10 years (Fazel et al., 2008a, 2008b; Colins et al., 2010; Kim et al., 2017), however, there are no studies that have evaluated sociodemographic and clinical characteristics (e.g., nonsuicidal self-injury and tattoos) together. It is shown that approximately, 70%–95% among adolescent prisoners have at least one psychiatry disorder (Colins et al., 2010; Kim et al., 2017).

Studies have reported that psychiatric disorders are more common among adolescent delinquents and increase criminal tendencies (Colins et al., 2010). A study conducted by Mannuzza et al. (2008) reported that attention deficit and hyperactivity disorder (ADHD) and related disruptive behavior problems increase the tendency of adolescent criminality. In a study from South Korea, Kim et al. (2017) reported that, in all, 90.8% of juvenile detainees had at least one psychiatric diagnosis, and 75.1% had psychiatric comorbidities. A study on adults showed higher rates of psychiatric comorbidity, which was found to be

a predisposing factor for committing repetitive crimes (Baillargeon et al., 2009).

Environmental factors are also important in criminality susceptibility of children and adolescents as well as psychiatric disorders. The heritability of antisocial behavior in children and adults is approximately 50%, and this shows the importance of environmental factors in antisocial behavior (Simonoff et al., 2004). Common adverse childhood experiences include low socioeconomic status (SES); separated families; physical, emotional, or sexual abuse; and physical and emotional neglect (American Psychological Association, 2007; Stoltenborgh et al., 2015). Adverse childhood experiences increase the risk of many psychiatric disorders, such as major depression, bipolar disorder, post-traumatic stress disorder (PTSD), substance and alcohol abuse, and neurobiological persistent changes in children (Nemeroff, 2016).

SES and social class are the basic determinants of lifelong development, happiness, and physical and mental health for humans (American Psychological Association, 2007). Income, education, and occupation are important factors in identifying SES (Lachman and

E-mail addresses: fatihceylan80@yahoo.com (M.F. Ceylan), shesapcioglu@ybu.edu.tr (S. Tural Hesapcioglu), meryemkasak90@gmail.com (M. Kasak), cpnrsn@gmail.com (C.P. Yavas).

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Weaver, 1998; Singh-Manoux and Marmot, 2005). Thus, the SES parameters are examined in the families of children who commit crimes in this study. Irregularities, domestic violence may affect the psychological well-being of children (Ibiloglu, 2012). This study examines sociodemographic factors such as family structure, number of siblings, alcohol and substance abuse, and committing crimes among family members of adolescent prisoners.

There is not enough information about the incidence of nonsuicidal self-injury (NSSI) and tattoos in adolescent prisoners. NSSI behaviors are described as deliberate self-induced harm actions on the surface of one's body that usually cause bleeding, bruising, or pain (e.g., cutting, burning, and hitting) without suicidal intent (American Psychiatric Association (APA, 2013). It has been shown in studies conducted with adults that higher rates of psychiatric disorders in prisoners lead to increased self-harm and suicide attempts (Preti and Cascio, 2006; Fazel et al., 2008a, 2008b). Tattooing is the conscious injuring of the skin by special tools that inject color into the skin with the purpose of obtaining permanent indelible images. In a study, students in the tattooed group more frequently abused drugs and committed traffic offenses compared to the students in the nontattooed group (Zrno et al., 2015).

Knowing the risk factors that predispose adolescents to criminal offenses will help us take action against them. The aims of this study are to investigate the psychiatric comorbidities in adolescent prisoners, examine the sociodemographic and clinical factors that may predispose them to commit offenses, and evaluate the data through comparison with a control group.

2. Method

2.1. Participants

In this study, 76 detained or convicted patients from the Ankara Child and Youth Closed Penal Execution Institution who were referred to the Ankara Yıldırım Beyazıt University Yenimahalle Educational and Research Hospital between December 2015 and September 2017 were included. Seventy-six age-matched patients who were admitted to the outpatient clinic for any reason at the same time were compared as a control group. The control group is selected from consecutively administered patients. For psychiatric diagnoses, the Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime version (K-SADS-PL) was administered by a child psychiatrist to the study and control groups. Physical examinations were performed to find NSSI and tattoo prevalence in all cases. Additionally, all subjects were evaluated by a semi-structured sociodemographic and clinic information questionnaire form. Informed consent was received from all patients participating in the study. The study was approved by the Ankara Yıldırım Beyazıt University Yenimahalle Education and Research Hospital Ethics Board.

Table 1

Comparison of sociodemographic and clinical characteristics of the study and control groups.

| | Prisoner Adolescents (n = 76) | | Control (n = 76) | | X ² | p |
|----------------------------------|-------------------------------|------|------------------|------|----------------|----------|
| | n | % | n | % | | |
| Nuclear family | 39 | 51.3 | 64 | 84.2 | 18823 | < 0.0001 |
| Low income level | 71 | 93.4 | 37 | 48.7 | 36.976 | < 0.0001 |
| Home ownership | 30 | 39.5 | 54 | 71.1 | 15.328 | < 0.0001 |
| Mother having a job | 15 | 19.8 | 20 | 26.4 | 0.928 | 0.44 |
| Literacy of the mother | 35 | 46.1 | 66 | 86.8 | 28.358 | < 0.0001 |
| Father having a job | 47 | 61.8 | 70 | 92.1 | 19.636 | < 0.0001 |
| Literacy of the father | 54 | 71.1 | 75 | 98.7 | 22.593 | < 0.0001 |
| Self mutilation | 56 | 73.7 | 13 | 17.1 | 49.074 | < 0.0001 |
| Crime committed by family member | 47 | 61.8 | 12 | 15.8 | 33.935 | < 0.0001 |
| Alcohol and/or substance abuse | 52 | 68.4 | 5 | 6.6 | 62.007 | < 0.0001 |
| Tattoo | 50 | 65.8 | 4 | 5.3 | 60.777 | < 0.0001 |

2.2. Data collection tools

2.2.1. K-SADS-PL

The K-SADS-PL is a semi-structured interview used to identify current and lifetime psychopathology in children and adolescents (Kaufman et al., 1997). The K-SADS-PL can address mood disorders, psychotic disorders, anxiety disorders, elimination disorders, disruptive behavior disorders, substance abuse, eating disorders, and tic disorders. A Turkish adaptation of this form was made by Gokler et al. (2004).

2.2.2. Sociodemographic and clinic information form

This form asks gender, age, educational status, how much time was spent in prison, the reason for being imprisoned (criminal justice), family structure (e.g., cohabiting parents, divorced parents, and death in family), family's income level, family's home ownership, number of siblings, parents' educational status, whether the parents are professed, whether there are other sentenced individuals in the family, self-mutilation, and whether they are tattooed.

2.3. Statistical analysis

The SES of the subjects' families were determined using Turk-IS's hunger and poverty threshold data for November 2015. Later, the subjects were compared as low and normal–high SES in two groups. The data that were not distributed normally were compared with the Mann–Whitney U test. The chi-square test was used to compare the sociodemographic and clinical characteristics, psychiatric diagnoses, and the educational statuses of the study and control groups. Logistic regression analysis was used to assess the predictors of committing crimes in adolescents. The statistical significance was accepted at $p < 0.05$.

3. Results

The mean age of the study group was 16.65 ± 0.57 years and of the control group was 16.55 ± 0.59 years ($Z = -1.277$, $p = 0.20$). The average length of stay in prison was 12.33 ± 10.52 months (Range: 1–48 months; median 12.0 months) when the adolescent prisoner was referred to the outpatient clinic.

Fifteen of the mothers in the control group were working as laborers (19.7%), one of them had died (1.3%), and the remainders were unemployed. In the control group, 20 of the mothers (26.3%) were working and 11 of the working mothers were laborers (14.4%). In the study group, 49 of the fathers (64.4%) were working, and 33 were laborers. In the control group, 70 of the fathers (92.1%) had jobs, 37 (48.6%) were laborers, and two had died (2.6%). The comparison of the study and the control groups in terms of sociodemographic and clinical features is shown in Table 1.

The number of siblings was 4.55 ± 2.05 (median = 4; range: 1–12)

Table 2
Comparison of the study and control groups in terms of psychiatric diagnoses.

| | Prisoner Adolescents (n = 76) | | Control (n = 76) | | X ² | p |
|-------------------------|-------------------------------|------|------------------|-------|----------------|----------|
| | n | % | n | % | | |
| Conduct Disorder | 65 | 85.5 | 9 | 11.8 | 81.661 | < 0.0001 |
| ADHD | 47 | 61.8 | 35 | 46.05 | 3.503 | 0.061 |
| Depression | 38 | 50.0 | 12 | 15.8 | 19.702 | < 0.0001 |
| Alcohol-substance abuse | 31 | 40.8 | 4 | 5.3 | 26.651 | < 0.0001 |
| Anxiety Disorders | 17 | 22.4 | 12 | 15.8 | 1.065 | 0.302 |
| PTSD | 15 | 19.7 | 0 | 0 | 16.435 | < 0.0001 |
| Psychotic Disorder | 3 | 3.9 | 1 | 1.3 | 6.468 | 0.011 |
| *ODD | 3 | 3.9 | 3 | 3.9 | 0 | 1.00 |
| Bipolar Disorder | 1 | 1.3 | 0 | 0 | 0.993 | 0.319 |
| Tic Disorder | 1 | 1.3 | 0 | 0 | 3.418 | 0.064 |
| ASD | 0 | 0 | 3 | 3.9 | 0.814 | 0.666 |

*DSM-IV (American Psychiatric Association, 1994) did not allow diagnosing ODD when CD was present. ADHD: Attention deficit hyperactivity disorder, PTSD: Post traumatic stress disorder, ODD: oppositional defiant disorder, ASD: autism spectrum disorder.

for the prisoners and 2.64 ± 1.40 (median = 2) for the control group. Statistically, the number of siblings was higher for prisoners (Z = -6.471, < 0.0001).

Although psychiatric comorbidity was common, none of the prisoner patients (100%) had received psychiatric treatment before entering prison. The comparison of the study and the control groups in terms of psychiatric diagnoses is given in Table 2. There was a significant difference in the presence of comorbid psychiatric diagnoses in the study and control groups (X² = 56.308; p < 0.001). In the study group, one patient (1.3%) had no diagnosis, 10 patients (13.2%) had a single psychiatric diagnosis, and 65 patients had two or more psychiatric comorbidities (85.5%). In the control group, 20 patients (26.3%) were diagnosed as having no psychiatric diagnosis, 37 patients (48.7%) had a single psychiatric diagnosis, and 19 patients (22.6%) had two or more psychiatric comorbidities. The number of comorbid diagnoses was 2–6 in the patient group and 2–3 in the control group.

Twelve patients (15.8%) were illiterate, while only one (1.3%) in the control group was illiterate. In the study group, 56 had not continued a school education, and only three in the control group had not attended school (X² = 76.790; p < 0.0001).

The distribution of alleged crimes committed by prisoners is detailed in Table 3. Logistic regression analysis was used to examine the variables that predict committing crimes in adolescents (Nagelkerke R Square = 0.87). Having a nuclear family, attending school, self-mutilation, having a tattoo, having a conduct disorder, ADHD, alcohol/ drug abuse and SES were the variables that entered the method. An enter method was used in the analysis. According to this study, not attending

Table 3
Distribution of alleged crimes committed by prisoners*.

| | n | % |
|----------------------------------|----|------|
| Theft | 21 | 27.6 |
| Illegal drug sale | 19 | 25 |
| Extortion | 17 | 22.4 |
| Offenses against sexual immunity | 9 | 11.8 |
| Attempted murder | 5 | 6.5 |
| Murder | 4 | 5.3 |
| Violation of anti-terrorism law | 3 | 3.9 |
| Wounding | 2 | 2.6 |

*Four of the cases were convicted of both theft and the sale of illegal drugs.

Table 4
Logistic regression analysis of variables that predict committing crimes in adolescents.

| | B | OR | p | CI |
|-----------------------------|--------|-------|---------|--------------|
| Nuclear family | -0.504 | 0.604 | 0.57 | 0.106-3.433 |
| Continuing school education | -3.527 | 0.029 | 0.001 | 0.004-0.214 |
| Self-mutilation | -1.959 | 0.141 | 0.020 | 0.027-0.737 |
| Tattoo | -2.362 | 0.094 | 0.018 | 0.013-0.671 |
| Conduct disorder | -3.616 | 0.027 | < 0.001 | 0.004-0.194 |
| ADHD | 0.205 | 1.227 | 0.799 | 0.254-5.925 |
| Alcohol and/or drug abuse | 0.514 | 1.672 | 0.632 | 0.204-13.733 |
| SES | -3.647 | 0.026 | 0.004 | 0.002-0.316 |

OR: Odds ratio, CI: Confidence interval, ADHD: Attention Deficit Hyperactivity Disorder. P < 0.05 statistical significance, ADHD: Attention deficit hyperactivity disorder, SES: socioeconomic status.

school, self-mutilation, tattoos, conduct disorder (CD), and a low-income level were observed as risk factors of committing crimes in adolescents (Table 4).

4. Discussion

This study was based on standardized direct interviews and psychiatric examinations of the participants. The aim of this study was to compare the prevalence of psychiatric disorders in the study and control groups and the sociodemographic and clinical features of children who committed crimes in order to understand the risk factors predisposing adolescents to criminal offenses.

The first finding of our study is that there was a high rate of psychiatric comorbid disorders in adolescent prisoners compared to the control group. In prisoners, CD (85.5%), ADHD (61.8%), depression (50%), substance abuse (40.8%), PTSD (19.7%), and psychotic disorder (3.9%) were seen more frequently than in the control group. Although in other studies performed in adolescents, lower rates of psychiatric comorbidity were reported (Colins et al., 2010), the K-SADS-PL interview with each participant ensured the reliability of comorbidity in our study. In a study conducted by Fazel et al. (2008a, 2008b) among boys, 3.3% were diagnosed with a psychotic illness, 10.6% with major depression, 11.7% with ADHD, and 52.8% with CD. In our study, the rates of psychiatric comorbidity were higher than in western societies.

Our study shows that, among psychiatric diagnoses, the CD is the highest risk factor for committing crimes in adolescents. CD is an enduring set of behaviors in adolescents that evolves over time and is usually characterized by aggression and a violation of others' rights. The conducted studies showed that adolescents who suffer from ODD are predisposed to CD, substance abuse, and committing crimes (Sadock et al., 2014; Aebi et al., 2016). The DSM-IV does not allow diagnosing ODD when CD is present (American Psychiatric Association (APA, 1994); therefore, in our study, ODD rates in the study group were not statistically different from the control group.

Forensic studies on young male prisoners have shown that ADHD is common among prison inmates, with a prevalence ranging from 21% to 45% (Westmoreland et al., 2010; Rosler et al., 2004). ADHD increases the risk of comorbid CD, antisocial personality disorder, and substance use disorder that may develop in patients in the future (Wilson and Marcotte, 1996; Harstad et al., 2017). In our study, none of the prisoners had received psychiatric treatment before entering prison. For this reason, they were adversely affected by the disorder. There are problems of impulse control in ADHD (American Psychiatric Association (APA, 1994), and impulsiveness is the most crucial personality dimension that predicts antisocial behavior (Lipsey and Derzon, 1998). Meta-analyses show that both ADHD and impulsiveness are strongly associated with delinquency (Pratt et al., 2002). In our study, ADHD frequency did not differ between the study and control groups, and ADHD did not appear to be a predictor of delinquency. This

may be because the control group consisted of patients that were referred to the child and adolescent psychiatry outpatient clinic. Currently, we know that the prevalence of ADHD in the child and adolescent psychiatry clinical sample is higher (Durukan et al., 2011; Faraone et al., 2003).

In this study, substance use disorder was found frequently in adolescent prisoners. Kim et al. (2017) reported that, in male juvenile detainees, the most common psychiatric disorder was alcohol use disorder, followed by CD and ADHD. Among the comorbidities present, alcohol use disorder and disruptive behavior disorder were the most common combination. Although drug or alcohol use does not cause CD, it increases the risks associated with it (Sadock et al., 2014). People with substance abuse, in particular, are reported to have a higher risk of re-incarceration, especially when they have a co-occurring severe mental illness (Baillargeon et al., 2009; Colins et al., 2010).

The second finding of our study was that the rate of continuing formal education of adolescent prisoners was lower than that of the control group. The rate of discontinuation of school education at the time of conviction was 84.2% for prisoners. Discontinuation of school education was one of the predictors of committing crimes in our study. Similarly, in an American study, there was a relationship between levels of education and crime (Swisher and Dennison, 2016). Early childhood education decreases crime and increases emotional self-regulation and emotional development (Hahn et al., 2016). Spending time outside school when children should be in school may increase the risk of committing crimes.

The third finding of our study is that the socioeconomic levels of the adolescent prisoners' families were lower than in the control group. Indicators of the socioeconomic levels of the prisoners' families, such as social welfare, level of education, and job opportunities, were found to be statistically insignificantly lower than the control group. SES has been reported to influence the psychological structure and the behavior of parents toward their children in previous studies. Parents with low SES train their children more strictly and implement more physical punishment during training (Gebara et al., 2016). Parents with moderate-high SES mostly resort to changing behavior by awarding prizes and providing rational justifications (Liebert et al., 1977). Additionally, a low SES has been found to increase the rate of aggressive behavior and becoming a victim in studies on adolescents (Chen and Paterson, 2006; Pabayo et al., 2014).

Another finding of our study is the remarkable prevalence of material offenses, such as theft (27.6%), drug trafficking (25%), and extortion (22.4%). The majority of adolescents in our study are the children of low-income families, and this may have predisposed them to commit these kinds of criminal offenses that have financial outcomes. It has been reported that the most common crime committed by children and adolescents is theft (Goker et al., 2006). In the studies conducted, it was observed that, in poor families, communication in the family deteriorated and child neglect and abuse were more frequent (Ondersma, 2002). It also was reported that traumatic events that took place during childhood increased aggression in adolescents (Tural Hesapcioglu and Altıparmak, 2015) and a tendency toward crime (Bielas et al., 2016). Our study did not directly address childhood trauma, but PTSD was more common in juvenile delinquents than in the control group.

The fourth finding of our study was about the family structure. Only 51.3% of the prisoners had both parents living together. The remainder's parents were divorced or had died. In the prisoners' families, the rate of family members who had previously been involved in the judicial crime was 61.8%, and the rate of alcohol or substance abuse among family members was 68.4%. It has been reported that chaotic home conditions are related to CD and committing crimes. Divorce alone is not a risk factor, but the persistence of hostility, resentment, and bitterness worsens the situation. Substance and alcohol abuse in parents also increases the risk of developing CDs in children (Sadock et al., 2014). The conflicts between parents themselves are related to antisocial behaviors in adolescents (Buehler et al., 1997).

The fifth finding of our study is that NSSI (73.7%) and tattooing frequency (65.8%) were significantly higher in prisoners than in the control group. To the best of our knowledge, this is the first study to investigate the prevalence of NSSI and tattoos in adolescent prisoners. NSSI is especially prevalent during adolescence, with mean and pooled rates of 17–18% in recent reviews of community samples (Muehlenkamp et al., 2012; Swannell et al., 2014). In our study, NSSI, which is more frequent in adolescent prisoners than in the average population, was one of the predictors of delinquency. Adverse childhood experiences of children and adolescents have been associated with NSSI in a previous study (Kaess et al., 2013). It is shown that NSSI risk is higher with internalizing and externalizing problems and this behavior is increasing in adolescence. The distinction between NSSI and suicide is difficult and it is an ethical issue in such study samples. Thus, good designed studies are needed to identify NSSI and suicide attempts (Bhola et al., 2017; Singhal and Bhola, 2017; Leung et al., 2019).

Tattoos were also predictors of delinquency in our study. In a study conducted in Taiwan among high school students, the older students who had criminal records or were in a gang were more likely to have tattoos. Tattooing also was found to be associated with violence, weekly alcohol consumption, illicit drug use, and dropping out of school (Yen et al., 2012). Most medical investigations concerning tattoos are devoted to personal hygiene, infectious diseases (hepatitis C and HIV), and dermatological problems inherent to the tattoo drawing itself (Borokhov et al., 2006). Although there are few studies that examine the relationship between tattooing frequency and psychiatric disorders, tattoos may be related to substance abuse and personality disorders (Borokhov et al., 2006; Dhossche et al., 2000).

The present study contained a number of limitations. The most prominent limitation of this study is the relatively small sample size and the control group did not consist of the healthy subjects. In addition, when sociodemographic characteristics were being compiled, the information was only taken from the prisoners; no interviews were held with their families.

In conclusion, a number of comorbid psychiatric disorders, substance abuse of the adolescents and their family members, low socioeconomic status, family disorganization, and interruption of education were frequent in adolescent prisoners in this study. It is worth noting that none of the adolescents who had committed crimes had received psychiatric treatment despite such a high psychiatric comorbidity rate. Our findings emphasize the importance of early psychiatric treatment and family-based interventions to help prevent adolescents from committing crimes. Nonsuicidal self-injury and tattoos may be related to CD and committing crimes in adolescents.

Conflict of interest

The authors declare that they have no conflict of interest.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

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