Suicidality, Psychopathology, and Gender in Incarcerated Adolescents in Austria

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Objective: Delinquent juveniles are at extreme risk for suicide with death rates 4 times higher than in the general population. Whereas psychopathologic risk factors for suicidal behavior in nonforensic adolescent populations are well defined, psychopathologies associated with suicidality in delinquent juveniles are not yet clear. The objective of this study was to determine gender-specific psychopathologic profiles associated with suicidality in detained juveniles.

Method: The Massachusetts Youth Screening Instrument-Second Version, the Youth Self-Report, and the Mini-International Neuropsychiatric Interview for children and adolescents were used to investigate juveniles in an Austrian pretrial detention facility. The study sample consisted of all juveniles entering the system between March 2003 and January 2005. Of the 370 eligible participants, 319 completed the study (53 girls and 266 boys; age range, 14 to 21 years; mean = 16.67, SD = 1.45 years).

Results: We found significantly higher prevalence rates of both current ($p < .01$) and lifetime ($p < .001$) suicidality in girls than in boys. Suicidal boys exhibited more psychopathology and a wider range of psychopathology compared to nonsuicidal boys. For suicidal girls, psychopathologies appeared more circumscribed (all relevant p values < .04). Using signal detection methods, major depressive disorder, attention-deficit/hyperactivity disorder, and social phobia identified boys at highest risk of suicidality, while a diagnosis of posttraumatic stress disorder identified girls at highest risk.

Conclusions: Suicidality levels are high in delinquent adolescents, especially in girls. Psychopathologic risk factors seem to be gender specific in this population. Not only depression, but also psychopathologies that usually do not arouse strong suspicion for an association with suicidal behavior, i.e., social phobia and ADHD in boys and PTSD in girls, might increase suicide risk. Further research in other countries is needed to replicate our results with respect to sociocultural influences.

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Suicide is the second leading cause of death for 14 to 17 year olds.[1] Data available indicate that suicide is especially common among delinquent juveniles, with death rates 4 times higher than in the general population.[2] In parallel vein, delinquency was found to be significantly associated with seriously considering suicide, making a suicide plan, attempting suicide, and requiring medical treatment following a suicide attempt. These associations were strongest for delinquent girls, with up to 5 times the likelihood when compared with nondelinquent girls.[3]

Whereas there is general consensus that certain psychopathologies (i.e., depression, bipolar disorder, substance abuse, and disruptive disorders) are the major psychopathologic predictors for suicidal behavior in nonforensic populations,[4–8] specific predictors in delinquent juveniles have not been well defined. Some studies found depression to play a major role,[9–12] while others were not able to replicate these results.[13] Further, the role of conduct disorder and substance abuse is not clear, with results ranging from severe to no impact on suicidality in delinquent adolescent populations.[9,12,13] Finally, as girls are at extreme

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risk, gender-specific psychopathologic profiles may also be relevant in this context,[6,14] but have not been published so far.

Therefore, the aim of this study was to describe gender-specific psychopathologic profiles associated with suicidality in a high-risk population of incarcerated delinquent juveniles.

On the basis of data currently available, we tested the following hypotheses:

1. There are higher levels of current and lifetime suicidality in delinquent girls than in delinquent boys.
2. Psychopathologies associated with suicidality in delinquent juveniles are different from those found in nonforensic juvenile populations.
3. Psychopathologic profiles found in delinquent suicidal juveniles are gender specific.

METHOD

The study was performed at the Vienna county jail, Justizanstalt Josefstadt, which is the sole detention facility for juveniles awaiting trial in Vienna, Austria. According to Austrian law, juveniles aged 14 to 21 years who are accused of illegal activities (e.g., arson, robbery, drug-related crimes, homicide, sexual assault, child molestation, and burglary) are under the supervision of the Austrian juvenile court and can be held pretrial in secure detention centers.

Subjects

Juveniles who were admitted to this specific correctional facility between March 2003 and January 2005 formed the general study sample. Both first-time offenders and recidivists aged 14 to 21 years were included. Inclusion criteria were sufficient reading and writing skills and sufficient command of the German language to complete self-rating measurements. Exclusion criteria were significant medical conditions (e.g., acute state of human immunodeficiency virus, hepatitis, or other infectious disease) and/or neurologic disorders (e.g., epilepsy), mental retardation, and psychotic symptoms present at the time of the study.

Juveniles were approached within 4 days of admission and invited to participate in the study. The study was explained and confidentiality was assured (with the exception of acute suicidal or homicidal risk). Participants signed an assent form if they were younger than 18 years or a consent form if they were 18 years or older. The study was reviewed, approved, and supervised by the ethics committee of the Medical University Vienna.

Procedures and Measures

The adolescents participated in 2 sessions of 1 to 2 hours' duration. In the first session, participants were asked to fill out self-rating measurements in groups of 3 to 4. In the second session, each participant was individually interviewed in a private area. Three interviewers were engaged: S.M.B., J.K., and B.P. All interviewers are forensic child psychiatry fellows.

Session 1

Intake data. We obtained general demographics such as age, gender, ethnicity, and self-reported level of completed education.

Massachusetts Youth Screening Instrument. The Massachusetts Youth Screening Instrument-Second Version (MAYSI-2) is a 52-item, yes/no self-report instrument developed specifically for use in youth entering the juvenile justice system. It identifies symptoms of distress and manifest feelings that are characteristic of disorders among youth or behaviors that require intervention. It focuses on recent or current problems and is suitable for youth who read at fifth-grade level. The items produce 6 clinical scales (alcohol/drug use, angry/irritable, depressed/anxious, somatic complaints, suicide ideation, and thought disturbance) and 1 nonclinical scale (traumatic experiences). The MAYSI-2 was found to have good psychometric properties.[15]

Youth Self-Report. The Youth Self-Report (YSR) is a 112-item self-report questionnaire designed to assess emotional and behavioral symptoms in adolescents. It provides 8 symptom scales (withdrawal, somatic complaints, anxiety/depression, social problems, thought problems, attention problems, delinquent behavior, and aggressive behavior) and 2 summary scales (externalizing, internalizing). The validity and reliability of the YSR scales has been well established.[16]

Session 2

Mini-International Neuropsychiatric Interview for children and adolescents. The Mini-International Neuropsychiatric Interview (MINI) is a short structured diagnostic interview for DSM-IV and ICD-10 psychiatric disorders. It has been proven to have good reliability and validity when compared with the Structured Clinical Interview for DSM-III-R, Patient Version (SCID-P) and the Composite International Diagnostic Interview for ICD-10 (CIDI).[17] The MINI provides a spectrum of DSM-IV and ICD-10 diagnoses: mood disorders, anxiety disorders, substance use disorders, psychotic disorder, and eating disorders. The MINI for children and adolescents (MINI Kid) is derived from the original MINI. Relevant child and adolescent psychiatric DSM-IV and ICD-10 diagnoses, i.e., separation anxiety disorder, tic disorders, attention-deficit/hyperactivity disorder (ADHD), conduct disorder, oppositional defiant disorder, adjustment disorder, and pervasive developmental disorder, have been added.[17]

The MINI Kid allows assessment of current prevalence of the disorders mentioned above; furthermore, it offers

the assessment of lifetime prevalence for the following 3 diagnoses: mania, psychotic disorder, and panic disorder.

In this study, we focused on current diagnoses. We did not assess adjustment disorder because the specific circumstances of incarceration may lead to an overestimation in this special sample.

Assessment of Suicidality and Suicidal Ideation

Suicidality (lifetime and current) was assessed using the suicidality mode of the MINI Kid. The lifetime suicidality mode consists of the following 3 questions: Have you ever felt so bad that you wished you were dead? Have you ever tried to hurt yourself? Have you ever tried to kill yourself? If any of the questions are answered with yes, lifetime suicidality is coded with yes. The current suicidality mode consists of 5 questions: In the past month did you (1) wish you were dead? (2) want to hurt yourself? (3) think about killing yourself? (4) think of a way to kill yourself? and (5) try to kill yourself? If any of the questions are answered with yes, current suicidality was coded with yes.

Suicidal ideation was assessed by the suicide ideation scale of the MAYSI-2.[15]

Translation

Instruments not available in the German language at the point of data collection, specifically, the MINI Kid and the MAYSI-2, were translated following established guidelines, using independent back translation.[18] The translation of the MINI Kid was approved by the original authors and is the currently available official German version of the MINI Kid.

Data Analyses

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 13.0 (SPSS Inc., Chicago, Ill.). Descriptive statistics, χ^2 tests, and 1-way analysis of variance were used to examine differences in quantitative (self-report measures) and qualitative (structured interview) data between groups. Two-tailed tests were used with a significance level set at $p < .05$.

In order to identify characteristics of subgroups at risk for current suicidality, we performed a signal detection analysis using receiver operating characteristic curves using ROC4 software (United States Department of Veterans Affairs–Mental Illness Research Education and Clinical Center Home [VISN21], available at http://mirecc.stanford.edu).[19] This procedure is exploratory and involves no parametric assumptions.[20] Second, multicolinearity has very little effect on the results of signal detection.[19] Third, signal detection is highly sensitive to the existence of interactions.[21] Finally, this procedure optimizes the decision rule that results by balancing the emphasis on sensitivity and specificity. In this analysis, to determine optimal cut points, equal weight is placed on avoiding false positives and negatives. The procedure examines all possible variables at all possible cut points to identify the optimal dichotomization. It then splits the sample into the groups defined by that dichotomy and repeats the process. The procedure stops when the optimal stopping rule applies: when tested with a 2×2 χ^2 test, the optimal rule has a p value less than 1%, or when a subgroup has too small a sample size (less than 10) for further analysis. The result is a decision tree, with identification of subgroups at different levels.[19,20,22]

RESULTS

Of the 370 individuals who fulfilled the inclusion and exclusion criteria, 8 juveniles refused to participate in the study, 43 juveniles left the detention center before the whole test battery was administered, and 319 juveniles completed all the measures involved in this study. The final sample comprised 53 girls (16.6%) and 266 boys (83.4%). Age ranged from 14 to 21 years, with a mean age of 16.67 (SD = 1.45) years in the total sample; mean age of 17.79 (SD = 1.71) years in the female subsample and mean age of 16.45 (SD = 1.29) years in the male subsample. The girls in our sample were significantly older than the boys (Mann-Whitney test: $U = 3746.5$, $p < .001$).

Prevalence Rates of Suicidality in Our Sample of Delinquent Juveniles

Of the sample of 319 participants, 69 juveniles (21.6%) reported current suicidality and 127 (39.8%) reported lifetime suicidality. Within the total of 53 girls, 19 (35.8%) reported current suicidality and 36 (67.9%) reported lifetime suicidality. Within the total of 266 boys, 50 (18.8%) reported current suicidality and 91 (34.2%) reported lifetime suicidality. We found a significantly higher prevalence of both current ($\chi^2 = 7.58$, $df = 1$, $p < .01$) and lifetime ($\chi^2 = 20.96$, $df = 1$, $p < .001$) suicidality in girls than in boys.

Prevalence Rates of Psychopathology in Currently Suicidal Versus Currently Nonsuicidal Groups

In the next step, we separated individuals into currently suicidal and currently nonsuicidal individuals on the basis of the binominal current suicidality scale in the MINI Kid. We did this separately for both genders. We did not find significant differences with respect to the mean age for girls (Mann Whitney: $U = 300.5$, $p \leq .802$) or for boys ($U = 52211.5$, $p \leq .692$) when comparing the currently suicidal and currently nonsuicidal groups.

For boys, we found higher prevalence rates of psychopathology in the currently suicidal group compared to the currently nonsuicidal group. Significant differences (Table 1) were found for major depressive disorder, dysthymic disorder, panic disorder, separation anxiety disorder, social and specific phobia, posttraumatic stress

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Table 1. Prevalence of Psychopathologies in Currently Nonsuicidal and Currently Suicidal Delinquent Juveniles According to Sex[a]

Diagnosis	Currently Nonsuicidal Boys (N = 216), % (N)	Currently Suicidal Boys (N = 50), % (N)	χ^2 (p Value), 2-tailed	Currently Nonsuicidal Girls (N = 34), % (N)	Currently Suicidal Girls (N = 19), % (N)	χ^2 (p Value), 2-tailed
Major depressive disorder	9.3 (20)	36.0 (18)	23.7 (< .001)	17.6 (6)	31.6 (6)	1.4 (.245)
Dysthymic disorder	7.4 (16)	28.0 (14)	17.2 (< .001)	11.8 (4)	31.6 (6)	3.1 (.140)
Mania	0.9 (2)	2.0 (1)	0.4 (.466)	0 (0)	0 (0)	NA
Panic disorder	1.4 (3)	8.0 (4)	6.9 (.025)	2.9 (1)	26.3 (5)	6.6 (.018)
Agoraphobia	7.9 (17)	12.0 (6)	0.9 (.349)	14.7 (5)	31.6 (6)	2.1 (.146)
Separation anxiety disorder	11.6 (25)	24.0 (12)	5.2 (.023)	47.1 (16)	52.6 (10)	0.2 (.697)
Social phobia	3.7 (8)	12.0 (6)	5.6 (.018)	8.8 (3)	10.5 (2)	0.1 (.100)
Specific phobia	4.2 (9)	14.0 (7)	6.9 (.008)	20.6 (7)	10.5 (2)	0.9 (.463)
Obsessive-compulsive disorder	2.3 (5)	8.0 (4)	4.0 (.067)	0.0 (0)	15.8 (3)	5.5 (.044)
PTSD	21.3 (46)	36.0 (18)	4.8 (.028)	44.1 (15)	78.9 (15)	6.0 (.014)
Alcohol abuse	16.2 (35)	14.0 (7)	0.1 (.700)	8.8 (3)	26.3 (5)	2.9 (.118)
Alcohol dependence	13.4 (29)	30.0 (15)	8.1 (.004)	8.8 (3)	15.8 (3)	0.6 (.655)
Drug abuse	14.4 (31)	18.0 (9)	0.4 (.515)	5.9 (2)	0.0 (0)	1.2 (.531)
Drug dependence	47.2 (102)	60.0 (30)	2.7 (.103)	73.5 (25)	84.2 (16)	0.9 (.373)
ADHD combined	14.8 (32)	32.0 (16)	8.1 (.004)	11.8 (4)	31.6 (6)	3.1 (.140)
ADHD inattentive	6.5 (14)	14.0 (7)	3.2 (.076)	5.9 (2)	0.0 (0)	1.2 (.531)
ADHD hyperactive	15.3 (33)	12.0 (6)	0.3 (.555)	8.8 (3)	10.5 (2)	0.1 (1.00)
Conduct disorder	66.7 (144)	82.0 (41)	4.5 (.034)	61.8 (21)	84.2 (16)	2.9 (.088)
Oppositional defiant disorder	38.9 (84)	62.0 (31)	8.8 (.003)	47.1 (16)	57.9 (11)	0.6 (.449)
Generalized anxiety disorder	8.3 (18)	30.0 (15)	17.7 (< .001)	23.5 (8)	31.6 (6)	0.4 (.524)

[a]For groups in which N < 5, Fisher exact test (2-tailed) is reported.
Abbreviations: ADHD = attention-deficit/hyperactivity disorder, NA = not applicable, PTSD = posttraumatic stress disorder.

Table 2. Massachusetts Youth Screening Instrument-Second Version (MAYSI-2) Scores in Currently Nonsuicidal and Currently Suicidal Delinquent Juveniles According to Sex

Symptom Scale	Currently Nonsuicidal Boys (N = 215[a]), mean (SD)	Currently Suicidal Boys (N = 50), mean (SD)	F (p Value)	Currently Nonsuicidal Girls (N = 34), mean (SD)	Currently Suicidal Girls (N = 19), mean (SD)	F (p Value)
Alcohol/drug use	3.15 (2.67)	3.82 (2.70)	2.52 (.113)	4.15 (2.62)	4.84 (2.24)	0.95 (.335)
Angry/irritable	3.18 (2.54)	4.68 (.353)	14.24 (< .001)	4.38 (2.47)	5.95 (1.78)	5.88 (.019)
Depressed/anxious	2.37 (2.14)	4.28 (2.63)	29.50 (< .001)	3.65 (2.32)	5.26 (1.82)	6.84 (.012)
Somatic complaints	2.17 (1.74)	3.08 (1.68)	11.34 (.001)	3.09 (1.83)	4.00 (1.67)	3.22 (.079)
Suicide ideation	0.80 (1.27)	2.51 (1.92)	58.48 (< .001)	1.61 (1.77)	3.47 (1.21)	16.61 (< .001)
Thought disturbance	0.86 (1.14)	1.20 (1.10)	3.66 (.057)	1.15 (1.40)	1.95 (1.72)	3.40 (.071)
Traumatic experiences	1.89 (1.57)	2.98 (1.52)	19.92 (< .001)	2.32 (1.84)	3.11 (1.24)	2.73 (.105)

[a]MAYSI-2 scores of 1 currently nonsuicidal boy were missing.

disorder (PTSD), alcohol dependence, ADHD combined, conduct disorder, oppositional defiant disorder, and generalized anxiety disorder.

Girls in the currently suicidal group had higher prevalence rates of psychopathology than those in the currently nonsuicidal group, but for only 3 diagnoses were the differences statistically significant: panic disorder, obsessive-compulsive disorder, and PTSD (see Table 1).

Symptom Scales and Current Suicidality

For the MAYSI-2 subscales, we found elevated levels of internalizing and externalizing symptoms for both genders in the currently suicidal group compared to the currently nonsuicidal group (Table 2). Specifically, for boys we found significant differences in the angry/irritable, depressed/anxious, somatic complaints, suicide ideation, and traumatic experiences subscales. For girls, we found significant differences in the angry/irritable, depressed/anxious, and suicide ideation subscales.

For the symptom scales of the YSR (Table 3), we found significantly elevated levels of withdrawal, anxiety/depression, social problems, thought problems, attention problems, and delinquent behavior in currently suicidal boys when compared to currently nonsuicidal boys. For girls, we found significantly elevated levels of withdrawal, anxiety/depression, social problems, and thought problems between the currently suicidal and currently nonsuicidal groups.

Subgroups of High Risk for Suicidality: Signal Detection

In order to better understand the gender differences found in our sample and to be able to be more specific in the phenomena observed, we performed a signal detection analysis.

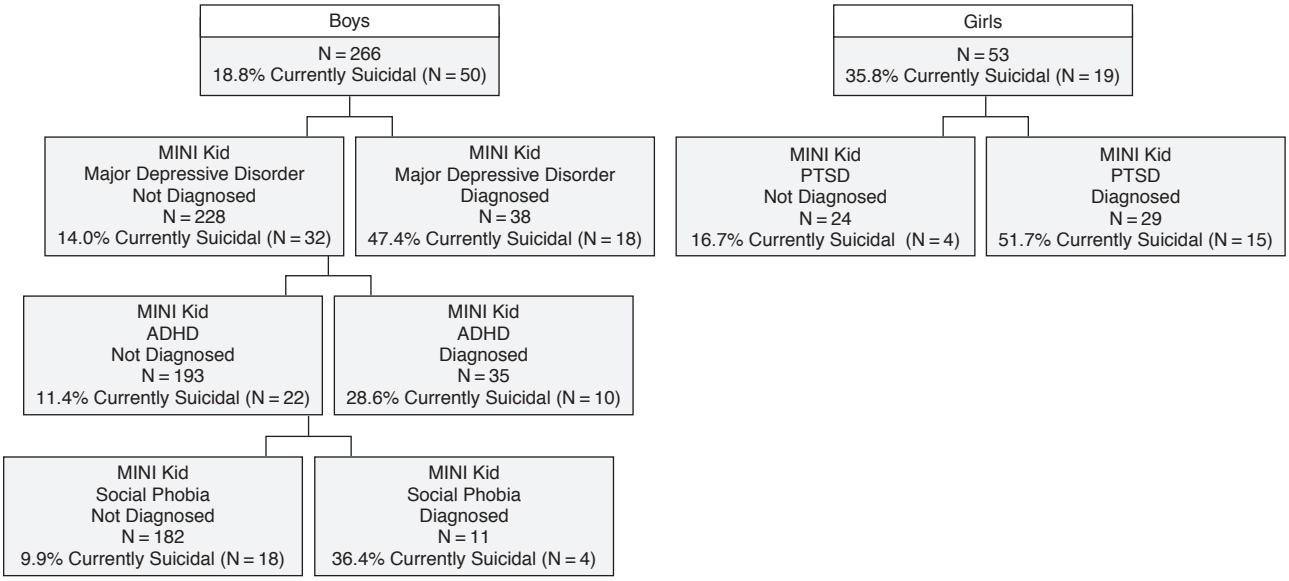
Signal detection and psychopathology for boys. In this case, the outcome was current suicidality, and the predictors offered included the psychiatric diagnoses assessed by the MINI Kid.

Table 3. Youth Self-Report (YSR) Scores in Currently Nonsuicidal and Currently Suicidal Delinquent Juveniles According to Sex[a]

Symptom Scale	Currently Nonsuicidal Boys (N = 210), mean (SD)	Currently Suicidal Boys (N = 49), mean (SD)	F (p Value)	Currently Nonsuicidal Girls (N = 33), mean (SD)	Currently Suicidal Girls (N = 19), mean (SD)	F (p Value)
Withdrawal	3.72 (2.54)	5.43 (2.89)	16.89 (< .001)	4.36 (2.45)	5.89 (2.49)	4.66 (.036)
Somatic complaints	2.74 (2.93)	3.61 (2.91)	3.55 (.061)	4.57 (3.48)	5.57 (4.82)	0.75 (.390)
Anxiety/depression	7.74 (5.55)	12.57 (6.35)	28.46 (< .001)	9.94 (5.78)	16.26 (6.68)	12.87 (.001)
Social problems	3.30 (2.42)	4.41 (2.60)	8.18 (.005)	2.97 (2.38)	4.63 (2.36)	5.92 (.019)
Thought problems	1.57 (2.01)	2.69 (2.09)	12.23 (.001)	1.75 (1.77)	4.58 (2.89)	19.14 (< .001)
Attention problems	5.78 (3.16)	7.63 (3.44)	13.21 (< .001)	6.79 (3.78)	8.63 (3.61)	2.96 (.091)
Delinquent behavior	7.67 (3.97)	9.33 (3.64)	7.16 (.008)	10.03 (4.72)	10.74 (5.34)	0.25 (.623)
Aggressive behavior	10.16 (6.06)	12.00 (5.91)	3.71 (.055)	12.55 (5.72)	16.37 (8.71)	3.65 (.062)
Internalizing	13.64 (9.10)	20.53 (9.80)	22.15 (< .001)	18.00 (8.65)	26.42 (11.07)	9.29 (.004)
Externalizing	17.82 (9.08)	21.33 (8.68)	6.00 (.015)	22.58 (9.43)	27.11 (13.44)	2.03 (.161)

[a]Due to missing data, YSR symptom scale scores were only available in 210 currently nonsuicidal and 49 currently suicidal boys and in 33 currently nonsuicidal girls.

Figure 1. Signal Detection for the Outcome of Current Suicidality Based on Psychopathologic Diagnostic Status for Delinquent Juveniles According to Sex



Abbreviations: ADHD = attention-deficit/hyperactivity disorder, MINI Kid = Mini-International Neuropsychiatric Interview for children and adolescents, PTSD = posttraumatic stress disorder.

As shown in Figure 1, four subgroups of boys were identified, with the percentages of suicidal individuals ranging from 47.4% to 9.9%. At highest risk were those with a diagnosis of major depressive disorder (prevalence = 47.4%); at next highest risk were those without either depressive disorder or ADHD but with a diagnosis of social phobia (prevalence = 36.4%), followed by those without major depressive disorder who had a diagnosis of ADHD (prevalence = 28.6%). The lowest risk group included those with none of these diagnosed conditions (prevalence = 9.9%).

Signal detection and psychopathology for girls. Similarly for girls, the outcome was current suicidality, and the predictors offered included the psychiatric diagnoses assessed by the MINI Kid.

As shown in Figure 1, two subgroups were identified for girls. At highest risk were those with a diagnosis of PTSD (prevalence = 51.7%). The lowest risk group consisted of those without a diagnosis of PTSD (prevalence = 16.7%).

Signal detection and symptom scales for boys. In this analysis, the outcome was current suicidality, and the predictors offered included the psychopathologic symptom scales of the MAYSI-2 and the YSR. As shown in Figure 2, for the symptom scales of MAYSI-2 and YSR, 3 subgroups were identified, with the percentage of individuals who were suicidal ranging from 58.1% to 10.2%. At highest risk were those with a suicide ideation score on the MAYSI-2 of at least 4 (prevalence = 58.1%); at next highest risk were those with a suicide ideation score lower

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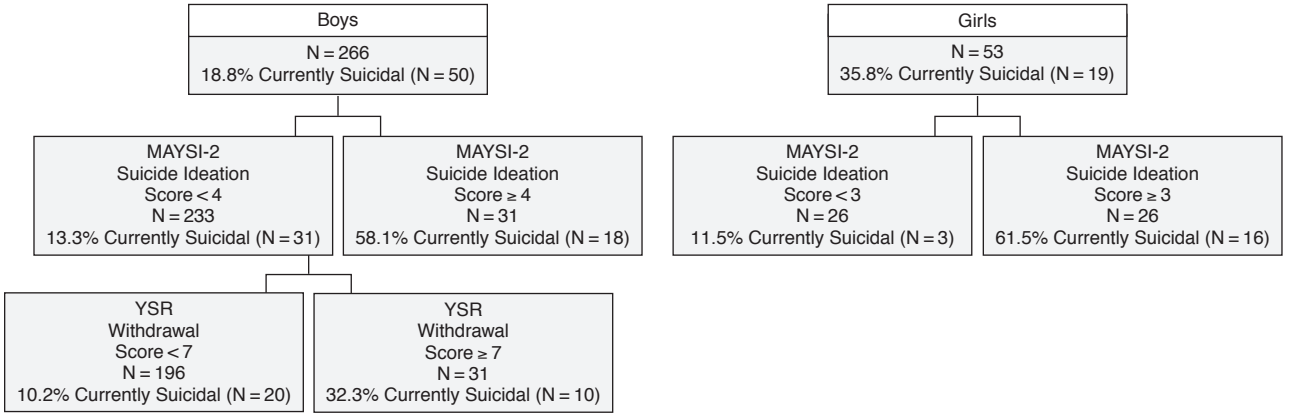
Figure 2. Signal Detection for the Outcome of Current Suicidality Using the Symptom Scales of YSR and MAYSI-2 for Delinquent Juveniles According to Sex[a]



[a]Differences in numbers are due to missing data in the relevant YSR and MAYSI scores.
Abbreviations: MAYSI-2 = Massachusetts Youth Screening Instrument-Second Version, YSR = Youth Self-Report.

than 4 and a score of at least 7 on the withdrawal scale of the YSR (prevalence = 32.3%). The lowest risk group included those with a score lower than 4 on the suicide ideation scale of the MAYSI-2 and a score lower than 7 on the withdrawal scale of the YSR (prevalence = 10.2%).

Signal detection and symptom scales for girls. Similarly for girls, the outcome was current suicidality, and the predictors offered included the psychopathologic symptom scales of the YSR and the MAYSI-2. As shown in Figure 2, for the symptom scales of MAYSI-2 and YSR, 2 subgroups were identified. Those with a suicide ideation score on MAYSI-2 of at least 3 had a prevalence of 61.5%, and those with a lower score had a prevalence of 11.5%.

DISCUSSION

In accordance with data published so far, we find higher rates of current and lifetime suicidality in girls than in boys. In addition, we find gender specific psychopathologic profiles distinguishing currently suicidal from currently nonsuicidal delinquent juveniles. For boys, a wide variety of psychopathology is significantly elevated in suicidal as compared to nonsuicidal individuals. The diagnoses most often reported in the literature—depression, conduct disorder, and substance abuse—are among these diagnoses. For girls, we find fewer disorders that separate suicidal from nonsuicidal individuals, and depression, substance abuse, or conduct disorder are not significantly more prevalent.

Similarly, in our sample of delinquent juveniles, suicidal boys show a wide range of significantly elevated, self-reported psychiatric symptoms, whereas for suicidal girls, the range of significantly elevated symptoms seems narrower, suggesting that in female offenders, the influence of psychopathology on suicidality might be more circumscribed.

According to signal detection analysis, 3 psychiatric diagnoses appear to play a decisive hierarchical role in suicidality in the boys of our sample: (1) major depressive disorder (2) social phobia, and (3) ADHD, with major depressive disorder being the diagnosis most strongly associated with current suicidality. This finding converges with those found in both nonforensic and forensic adolescent populations, confirming the role of depression as the major risk factor for suicidal behavior.[6,12] Secondly, our results suggest that inmates with social phobia show a considerable suicide risk. This result converges with studies linking social phobia and related problems with suicidal ideation in male offenders.[12] Finally, boys with ADHD—without comorbid depression—are third most likely to be suicidal, supporting previous research in forensic populations.[13] ADHD, specifically symptoms of hyperactivity and difficulty concentrating, might be disabling in coping with restrictive and punitive prison situations. Adolescents with social phobia may experience extreme anxiety when forced to interact with peers in correction facilities. With both diagnoses, adolescents may express suicidality in order to ameliorate their stress levels. Thus, although the cumulative effect of psychopathologies present in boys may enhance their risk for suicidality, certain diagnoses may interfere with coping skills needed for this unique stressful life event.

For the girls in our sample, the pattern of psychopathology associated with suicidality appears to be different. PTSD seems to be the major factor involved in suicidal behavior at the point of admission. This result converges with those found in other studies.[23] Although it remains unclear how PTSD affects suicidality, incarceration might retraumatize individuals with trauma-related

psychopathology, who already have minimized abilities to cope with stress. In contrast to boys, it appears that depression does not contribute to suicidality in our female subsample. This finding concurs with other reports in forensic female populations and additionally supports the claim that suicidal adolescent girls might not be homogeneous with their male peers.[6,12]

Finally, our results suggest that in our delinquent population, the MAYSI-2 is an adequate screening tool for suicidality for both genders. This is of importance as screening for suicidality at intake into juvenile hall was found to substantially lower the risk of suicidal behavior and suicide.[24]

Limitations

The sample in our study was limited to 1 juvenile correctional facility. While this facility comprises Vienna's entire population of pre-adjudicated youth, the cultural specificity of the study population limits generalization to other juvenile correctional facilities worldwide. Due to lower detention rates in girls, our female subsample was significantly smaller than our male subsample. This difference in subsample sizes could have biased our results, in that smaller sample sizes would decrease power to detect associations. Since the data are cross-sectional, conclusions about temporal and causal relationships between psychopathology and suicidality cannot be derived.

Finally, although the MINI Kid provides a wide variety of relevant child and adolescent psychiatric diagnoses, it does not assess pediatric bipolar disorder—a well-established risk factors for suicidal behavior in nonforensic adolescent populations.[25,26] As a result, our study does not provide information on the impact of bipolar disorder on suicidality in delinquent populations. Given the strong association found between depression and suicidality in our male sample, further evaluation of mood disorders in delinquent populations would be of great interest. Future studies should focus on the association of mood disorders—in particular, pediatric bipolar disorder—and suicidality in delinquent populations.

Strengths

We used a multi-method design combining a structured interview with self-rating questionnaires. Due to our very low dropout rate, our sample is representative of Austria's pre-adjudicated juvenile population. The investigators in this study had a high level of training in the field of child and adolescent psychiatry. We used not only multiple univariate, but also multivariate, statistical methods in order to best address our research questions. The statistical tool chosen is highly sensitive to existence of interactions and therefore allows us to demonstrate the impact of isolated psychopathology, regardless of comorbidity, on suicidality in this specific setting.[21]

CONCLUSION

Our study has clinical implications for a specific group of adolescents at high risk: it confirms high levels of suicidality in delinquent adolescents, especially in delinquent girls. It further defines specific psychopathologies contributing to suicide risk in these juveniles. According to our results, not only depression, but also other forms of psychopathologies that usually do not arouse strong suspicion for an association with suicidal behavior (social phobia and ADHD in boys and PTSD in girls), might increase suicide risk and therefore have to be assessed.

Consequently, we suggest screening at intake to heighten sensitivity toward suicide risk triggered by disorders not regularly suspected for suicidality: Since the completion of the study, we continue to use the MINI Kid as a clinical routine assessment device, and we heighten our efforts to prevent suicidality in juveniles with ADHD, social phobia, and PTSD in that such individuals are more likely to be transferred to wards for special needs. Further, all juveniles admitted to our juvenile hall are seen by trained child psychiatrists within 4 days of admission and, if necessary, transferred to a ward for special needs or put on medication. Finally, juveniles are at no time accommodated in a room alone but share rooms with 1 or 2 other juveniles. There is a possibility to call for medical assistance on a 24-hour basis. There is a secure environment available, in which the juveniles can be camera observed. So far (since the beginning of our study in 2003), there has been no incidence of suicide in our juvenile population. This may, in part, be due to the very tight prevention strategy based on the results of this study.

Finally, future research is needed: diagnostic entities associated with suicide risk in delinquent populations need to be studied in more depth. Similar studies in other countries are needed to replicate our results with respect to sociocultural influences. Prevention strategies have to be evaluated and standardized for forensic settings.

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