Violent girls in adolescent forensic care are more often psychotic and traumatized than boys in the same level of care

Riittakerttu Kaltiala-Heino, Markku Eronen & Hanna Putkonen

To cite this article: Riittakerttu Kaltiala-Heino, Markku Eronen & Hanna Putkonen (2014) Violent girls in adolescent forensic care are more often psychotic and traumatized than boys in the same level of care, The Journal of Forensic Psychiatry & Psychology, 25:6, 636-657, DOI: 10.1080/14789949.2014.943795

To link to this article: https://doi.org/10.1080/14789949.2014.943795

Published online: 12 Aug 2014.

Submit your article to this journal

Article views: 233

View Crossmark data

Citing articles: 2 View citing articles
Violent girls in adolescent forensic care are more often psychotic and traumatized than boys in the same level of care

Riittakerttu Kaltiala-Heino\textsuperscript{a,b,c*}, Markku Eronen\textsuperscript{b} and Hanna Putkonen\textsuperscript{d}

\textsuperscript{a}School of Medicine, University of Tampere, Tampere, Finland; \textsuperscript{b}Vanha Vaasa Hospital, Vaasa, Finland; \textsuperscript{c}Department of Adolescent Psychiatry, Tampere University Hospital, Tampere, Finland; \textsuperscript{d}Hospital District of Helsinki and Uusimaa, Kellokoski Hospital, Kellokoski, Finland

(Received 26 January 2014; accepted 3 July 2014)

Background: Most research on violent perpetrators is based on male samples. Aims: To compare girls and boys admitted to an adolescent forensic unit due to physically violent and/or sexually coercive behavior. Methods: On an adolescent forensic ward, demographics, family, treatment, crime and victimization histories, diagnose, psychiatric symptoms and violent behaviors during care of all adolescents are collected in a cumulative database. These were compared between girls and boys admitted due to violent behaviors. Results: Girls were more often diagnosed with schizophrenia group psychoses. The symptom profiles and violence risk ratings did not differ by sex. The girls were less antisocial in general. They were more suicidal and displayed more promiscuous behaviors, and they had more commonly been victims of sexual abuse. During inpatient care they displayed much more often violent and uncontrollable behaviors than the boys. Conclusion: Treatment approaches that respond to the special needs of aggressive girls are required.

Keywords: violence; aggression; adolescent forensic psychiatry; gender difference

Introduction

In general population, boys and men display more violent behaviors than girls and women. However, in samples of psychiatric inpatients with severe mental disorders, studies across cultures have found that this gender difference diminishes or is even reversed (Abderhalden et al., 2007; Barlow, Grenyer, & Ilkiw-Lavalle, 2000; Chou, Lu, & Mao, 2002; Grassi et al., 2006; Krakowski & Czobor, 2004; Mellesdal, 2003). In forensic settings women and men have been found to display aggressive acts of similar types and severity (Nicholls, Brink, Greaves, Lussier, & Verdun-Jones, 2009). Two studies in adolescent forensic services reported that a small group of girls perpetrated most of the

**Mental disorders and violence in adolescence**

During adolescence, the prevalence of mental disorders increases compared to childhood, and typical gender differences emerge. From puberty, girls present more frequently than boys with mood, anxiety, and eating disorders (Birmaher et al., 2007; Connolly, Bernstein, & Work Group on Quality, 2007; Nielsen, 2001), whereas boys more frequently suffer from conduct disorder, substance use disorders, and neuropsychiatric disorders such as ADHD and autism spectrum disorders (Fombonne, 2009; Rucklidge, 2010). Thus, the disorders most commonly associated with problems of aggression and violence (Mannuzza, Klein, & Moulton, 2009; Siponmaa, Kristiansson, Jonson, Nyden, & Gillberg, 2001; Sourander et al., 2006; Söderström, Nilsson, Sjödin, Carlstedt, & Forsman, 2005) are more common among boys. This is likely to contribute to the gender difference seen in violent behaviors in population level. Does the risk for violent behavior then become more similar between the sexes, if girls and boys are compared within diagnostic groups? Within conduct disorder, boys persist in more frequent violent behaviors (Ilomäki et al., 2006). Regarding ADHD, it has been suggested that girls more commonly display a profile of inattention, daydreaming, and passivity, whereas boys display impulsivity and hyperactivity (Rucklidge, 2010); these profiles suggest that aggression and violence are more likely to concern ADHD boys. Gender differences in communication difficulties, inattention, hyperactivity-impulsivity, and externalizing and repetitive behaviors have been suggested in autism spectrum symptom profiles, the male-associated symptoms perhaps leading to more interpersonal conflict and frustration and thus aggression, although not unanimously (Andersson, Gillberg, & Miniscalco, 2013; Kopp & Gillberg, 2011; Werling & Geschwind, 2013). Violent assaults on others are equally common among females and males suffering from substance abuse, although assaults by men tend to be more severe (Timko, Moos, & Moos, 2009). In adolescent inpatients, substance use disorders were a strong predictor of crime in general and violent crime in particular, especially among girls (Kjelsberg & Friestad, 2009). Psychotic disorders have repeatedly been associated with increased risk of violence (Taylor, 2008) and may predispose females to violent behaviors even more than males (Taylor & Bragado-Jimenez, 2009), although this research concerns adult rather than adolescent females.

**Are there gender differences in risk factors for violence in adolescence?**

Gender differences have been suggested in genetic risk for antisocial behavior (Eley, Lichtenstein, & Stevenson, 1999) and for related activities such as substance abuse (Miles, van den Bree, & Pickens, 2002). ADHD and autism
spectrum disorders are also considered to be largely genetically determined (Cortese, 2012; Schaaf & Zoghbi, 2011). However, the social norms of appropriate behavior across societies are also different for girls and boys (Keenan & Shaw, 1997), and the role of gender-specific socialization cannot be ruled out as a cause of gender-specific reactions—such as whether or not the adolescent displays a symptom profile characterized by aggression and violence—to developmental difficulties, neurocognitive deficits, trauma, and deprivation. An antisocial developmental trajectory may be more available for boys and internalizing symptoms for girls. It has, for example, been demonstrated that when cultural conditions do not tolerate antisocial development in males, the prevalence of depression increases in males to similar levels as in females (Egeland & Hostetter, 1983). Girls may, therefore, be less likely to behave violently than boys for both genetic and sociocultural reasons.

Risk factors for and correlates of delinquency, however, show many similarities across genders (Berkout, Young, & Gross, 2011; Miller, Malone, & Dodge, 2010; Odgers et al., 2008). Parental factors such as antisocial behaviors of parents, inconsistent and harsh discipline, and lack of warmth in the parent–child relationship predispose both girls and boys to antisocial development, as does disadvantaged environment at large. Callous-unemotional personality traits are associated with antisocial development in both genders (Berkout et al., 2011). And whether or not antisocial girls display more co-morbid or subsequent internalizing problems than antisocial boys remains contradictory (Berkout et al., 2011; Miller et al., 2010).

Antisocial developmental trajectories are associated with negative outcomes in interpersonal relationships in both girls and boys (Miller et al., 2010). Violently offending boys may, however, show higher rates of neurocognitive compromise and hyperactivity, and early emerging ‘uncontrolled temperament’ than girls (Berkout et al., 2011; Moffitt et al., 2001), and autonomic under-arousal/diminished reactivity appears to be associated with male antisocial development, whereas antisocial and aggressive girls may rather display autonomic hyperarousal (Berkout et al., 2011; Marsman et al., 2008). Although antisocial and aggressive developments are generally associated with behavioral disinhibition, males with CD were actually found to respond more than females with CD to negative consequences in an experimental study of high-risk youth (Hartung, Milich, Lynam, & Martin, 2002).

Overtly violent behavior particularly among girls has been explained in terms of experienced maltreatment, reaction to trauma, mental illness, or self-defense (Gammelgård, Weizmann-Henelius, Koivisto, Eronen, & Kaltiala-Heino, 2012; Motz, 2001; Odgers, Reppucci, & Moretti, 2005). Our own previous study on selected extremely uncontrollable violent girls pointed to this direction, but generalizing those findings to girls in general or even institutionalized girls at large warrants caution (Kaltiala-Heino et al., 2013). During adolescence in both boys and girls childhood experiences of maltreatment are associated with a variety of mental disorders and behavioral problems, including violence (Cutajar et al.,
Need for further research

Gender influences all social relationships and expectations, experiences and perhaps, even opportunities in all domains of life. It may also be an important factor for defining optimal treatment approaches among violent adolescents, if violent girls and boys differ from each other. It is, however, important to take into consideration the severity of the violence problem when comparing violent girls and boys. In order to emphasize the harmfulness of a variety of negative and aggressive behaviors, aggressive emotional and verbal communications are increasingly referred to as violence (emotional violence, verbal violence). When this is done, prevalence of ‘violence’ perpetrated by women and girls approaches that of men and boys, even if criminological studies repeatedly show that violence perpetrated by girls is milder than that perpetrated by boys, and seems to follow the trends seen among boys but nevertheless remaining in a lower level (Office for Juvenile Justice and Delinquency Prevention, 2008; Salmi, 2012). However, the groups are still different to start with, and comparisons are likely to yield this biased information.

Throughout the Western world, severely antisocial and violent adolescents end up in institutions that may, depending on the legislation, operate in the context of psychiatry, social welfare, or prison and probation services. Research among incarcerated adolescents offers an opportunity to study a relatively homogenous group of girls and boys regarding the severity of their violent behaviors. The aim of this study is to explore the similarities and differences between violent girls and violent boys institutionalized in adolescent forensic psychiatric care. We set out to study whether girls and boys detained in a secure ward due to violent behaviors differ regarding family background, criminal history, treatment history, victimization to physical and sexual abuse, psychiatric symptoms and diagnoses, and violent behaviors while institutionalized. Based on the literature review above, we hypothesized that risk factors for violence would be of similar nature among the girls and the boys, but as societal norms for appropriate behavior are stricter for girls, the violent girls would display the risk factors in excess as compared to the boys.

Materials and methods

Setting

The data were collected in the Adolescent Forensic Unit of Tampere University Hospital. The Adolescent Forensic Unit is a tertiary-level psychiatric inpatient service that provides assessment and treatment in a medium security ward for
minors with severe mental disorders and forensic background, and/or severe violent and noncompliant behavior. The 12-bed study unit is one of two tertiary-level adolescent forensic units in Finland (population 5.4 millions). In operation since 2003, the unit admits adolescents from secondary-level child and adolescent psychiatric services and from child welfare institutions. The patient mix is largely comparable to that of similar units in the UK, and the treatment principles correspond to those in similar units in the UK, the Netherlands, and Belgium (Berg, Kaltiala-Heino, Löyttyniemi, & Välimäki, 2013; Berg, Kaltiala-Heino, & Välimäki, 2011).

**Subjects**
A total of 149 adolescents (51 girls and 98 boys) were admitted to the study unit in 2003–2010. Of these, 16 (13 girls and 3 boys) had not displayed violent behaviors towards other people but presented with severe and persistent suicidal behavior that warranted placement in a secure unit. In addition, there were seven adolescents admitted (one girl and six boys) due to severely threatening behaviors (such as threatening school massacre) who had not actually displayed violence. Suicidal-only and threatening-only adolescents were excluded from the present study. Thus, the sample for analyses comprised 126 adolescents, of whom 37 were girls and 89 were boys, who were admitted due to violent behaviors towards others (physically violent behaviors severe enough to cause injury, or sexual aggression).

**Data collection**
Information on all admitted adolescents’ family backgrounds, parental mental, substance abuse and criminal problems, treatment history, history of criminal and delinquent behavior, of being victims of crime, of self-harming behaviors, somatic illnesses and antipsychotic medication use is routinely collected by adolescent psychiatrists in charge of the treatment of the patient in question in structured form during an initial assessment period and entered in a cumulative database. Psychiatric diagnoses are recorded after the assessment period (at two months after admission) by the treating adolescent psychiatrist, according to the ICD-10 classification of diseases.

**Discontinuities in parenting**
Parents divorced/separated (yes/no), adolescent taken into care by child welfare authorities (yes/no), the mother is not involved in the adolescent’s life (yes/no), the father is not involved in the adolescent’s life (yes/no)

**Parental problems**
Parental mental disorders (yes/no), substance abuse problems (yes/no), and criminal history (yes/no) were recorded if explicitly reported by the parents
during the assessment period or if documented in the adolescent’s social welfare and medical records.

**Age**

Age (in years) at admission and at first-ever inpatient admission was recorded.

**Violent and other criminal behavior**

History of violent crime or other severe violent behavior towards others (yes/no), other delinquency/crime history (yes/no), and history of sexually aggressive behavior comprising violent or coercive sexual behavior and sexual approaches to children clearly younger (several years) than the adolescent (yes/no) were recorded. It was recorded if the adolescent had ever been in court accused of criminal acts (yes/no).

**Victimization**

Physical abuse in the home (yes/no), physical abuse elsewhere than in the home (yes/no), sexual abuse (yes/no), and being a victim of other crimes (yes/no) were recorded. These were recorded if documented in the psychiatric or child welfare files of the adolescent or if explicitly reported by her/him during the assessment period. It was recorded if the adolescent had been in court as a plaintiff (yes/no).

**Self-harming behaviors**

Suicide attempts (yes/no), self-mutilation (yes/no), harmful abuse of alcohol and/or other substances (yes/no), and promiscuous behaviors (yes/no) were recorded.

**Medical**

Psychiatric diagnosis was recorded as set according to ICD-10 at the end of the assessment period. The psychiatric diagnoses are used as classified according to main ICD-categories: mental and behavioral disorders due to psychoactive substance abuse (F10–19), schizophrenia, schizotypal, and delusional disorders (F20–29), mood disorders (F30–39), neurotic, stress-related, and somatoform disorders (F40–49), behavioral syndromes associated with physiological disturbances and physical factors (F50–59), disorders of adult personality and behavior (F60–69), mental retardation (F70–79), disorders of psychological development (F80–89), behavioral and emotional disorders (F90–98), and unspecified mental disorder (F99). Somatic long-term illness requiring medical attention was recorded (yes/no). This includes any long-term illnesses requiring
regular checkups or treatments (e.g. epilepsy, diabetes, cardiac anomalies). Use of antipsychotic medication at admission was recorded (yes/no).

Psychopathology measures

As part of a routine assessment carried for all the adolescents admitted to the unit, psychotic symptoms, risk of violence, suicidality, hostility/aggression, and a range of symptom dimensions were assessed.

Psychotic symptoms were assessed by the Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1988), a clinician rated scale comprising 18 items commonly seen in different phases of psychotic illness. The BPRS has demonstrated good validity for assessing symptoms linked to psychological dysfunction and psychosis among adult patients (Hopko, Averill, Small, Greenlee, & Varner, 2001), and has previously been used in research on adolescent samples (Dittmann et al., 2008). The BPRS is rated by the adolescent psychiatrist in charge of the patient’s treatment during the assessment period in the unit.

Risk of violence was assessed with the Structured Assessment of Violence Risk in Youth (SAVRY; Borum, Bartel, & Forth, 2002), a professional judgment instrument constructed for estimating risk of severe violent behavior in 12- to 18-year olds. The predictive validity of the SAVRY was been shown to be good in the present sample (Gammelgård, Koivisto, Eronen, & Kaltiala-Heino, 2008), with AUC value of .84 among adolescent forensic patients, and highly increased Odds Ratios (crude, 28; controlled for age, sex, diagnosis, and level of service, 35; and further controlled for time spent in the institution, 74) for institutionalized violence among the SAVRY high-risk group as compared to the low-risk group. The SAVRY assessment is carried out by the treating adolescent psychiatrist who in cooperation with the multidisciplinary team uses all information elicited from the young person, her/his guardians, file information from previous psychiatric and child welfare settings, and all information obtained in structured assessments and observations during the assessment period in the study unit.

The Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974) is a self-report instrument of 20 items (each coded yes/no), designed to measure negative expectations about the future. Total scores range from 0 to 20 with higher scores indicating a greater degree of hopelessness. BHS scores are predictive of suicide attempts among adolescent psychiatric patients (Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999).

The Beck Scale for Suicidal Ideation (SSI) is a self-report scale measuring the intensity, pervasiveness, and characteristics of suicidal ideation (Beck & Deffenbacher, 2000). The psychometric properties of the SSI have been shown to be good in child and adolescent psychiatric patients (Allan, Kashani, Dahlmeier, Taghizadeh, & Reid, 1997; Holi et al., 2005).

Hostility/anger was measured with the Novaco Anger Scale (NAS), a self-report instrument that divides into three subscales illustrating three different levels of hostility: thoughts, emotion, and behavior. The NAS was developed
and validated for use with mentally disordered as well as normal populations, and has been widely used in anger research and validated in different populations (Novaco, 2009).

Self-reported depression was measured with the Children’s Depression Scale (CDI), a 27-item measure of depressive symptoms as well as symptoms of anxiety and conduct problems focusing on past 2 weeks (Kovacs, 1985; Sørensen, Frydenberg, Thastum, & Thomsen, 2005). CDI sum score was used as a continuous measure.

The SCL-90-R is a 90-item self-report symptom inventory that screens for a wide range of psychological problems. Each of the 90 items is rated on a 5-point scale of distress, ranging from – not at all – (0) to – extremely – (4). The answers are combined in nine symptom dimensions: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Hostility, Depression, Anxiety, Paranoid Ideation, Phobic Anxiety, and Psychosis. The subscales can be used as continuous measures but there are also cut-points to screen for clinically significant symptoms (Derogatis, 1977; Schmitz, Kruse, Heckrath, Alberti, & Tress, 1999).

**Episodes requiring the use of restraint**

The number of occasions when the adolescent had to be restrained due to uncontrollable violent or self-harming behavior, either physically or by using mechanical restraints, was recorded. Such episodes are carefully documented in case histories and in specific records kept by all psychiatric inpatient units as required by the Finnish Mental Health Act. The documentation of episodes requiring physical intervention is done by the nursing staff on structured forms and a database provided by supervising authorities. Episodes requiring the use of restraint were studied as a proxy for uncontrollable violent/suicidal behavior on the ward.

**Length of stay**

Length of stay was calculated in days between dates of admission and discharge.

**Statistical analyses**

Cross-tabulations with chi-square statistics (Fisher’s exact test where appropriate) were used for categorical variables to study differences between the girls and the boys. T-test was used to compare normally distributed continuous variables between the sexes and Mann–Whitney U-test for non-normally distributed continuous variables. Logistic regression was used to control for confounding due to differences between sexes in age and diagnostic distribution, when studying the effect of sex on dichotomous outcomes. To control for confounding due
to age and diagnostic distribution when comparing the sexes in relation to continuous outcome variables, linear regression was used for normally distributed outcome variables, and Cox regression for non-normally distributed outcomes.

**Ethical considerations**

The study received approval of the ethics committee of Pirkanmaa Hospital District.

**Results**

The girls were slightly older than the boys on admission to the study unit, and they had also been older than the boys at their first psychiatric admission (Table 1).

The girls had a diagnosis in the schizophrenia group and eating disorder more often than the boys (Table 2), while developmental disorders tended to be more common among the boys, otherwise the prevalence of the different psychiatric diagnoses did not differ according to sex.

It first seemed that mental disorders were more common among the girls’ parents, but this leveled out when confounding was controlled for in multivariate analysis. The girls were less likely than the boys to have a history of non-violent offending. They were more likely than the boys to have been victims of sexual abuse. Suicide attempt(s), self-mutilation, and promiscuous behavior were more common among the violent girls than among the violent boys (Table 1).

The mean scores on the Brief Psychiatric Rating Scale did not differ statistically significantly between the girls [mean (sd) 49.5 (15.5)] and the boys [mean (sd) 44.1 (13.1)] ($p = 0.09$). Controlling for confounding in linear regression did not change this finding.

The girls and the boys received comparable violence risk ratings in the SAVRY [girls mean (sd) 21.5 (7.3), boys mean (sd) 20.6 (8.5)], ($p = 0.61$). Controlling for confounding in linear regression did not change this finding.

**Self-report symptom measures**

There was considerable non-response in all the self-report symptoms measures included in the assessment routine: 24.6% in the SCL-90, 38.1% in the NAS, 42.1% in the CDI, 38.1% in the HS, and 36.5% in the SSI. The SCL-90, NAS, and CDI are included in the psychologist’s assessment protocol. The adolescents who did not give the self-report on the SCL-90 were more likely to also be non-responders on the NAS and the CDI than those who completed the SCL-90 ($p < 0.01$). Similarly, the HS and SSI are administered by psychiatrists, and those not responding to one of these scales were more likely to not respond to the other as well than those who completed one of these ($p < 0.01$). Those not completing the CDI were more likely to not complete the HS and
Table 1. Family background, treatment history, behavioral characteristics, and health of girls and boys admitted to adolescent forensic unit due to severe physically or sexually violent behaviors (%), and risk (OR, 95% C) for these by sex, adjusted for age and psychiatric diagnosis.

<table>
<thead>
<tr>
<th>Discontinuities in parenting</th>
<th>Girls n = 37</th>
<th>Boys n = 89</th>
<th>p</th>
<th>OR (95% CI); p adjusted for age and diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents divorced/separated</td>
<td>45.7</td>
<td>39.3</td>
<td>0.33</td>
<td>1.0 (0.4–2.4); 0.97</td>
</tr>
<tr>
<td>Young person taken into care</td>
<td>70.3</td>
<td>66.3</td>
<td>0.42</td>
<td>2.0 (0.7–5.2); 0.17</td>
</tr>
<tr>
<td>Mother not involved</td>
<td>16.2</td>
<td>13.6</td>
<td>0.45</td>
<td>1.2 (0.4–3.8); 0.75</td>
</tr>
<tr>
<td>Father not involved</td>
<td>21.6</td>
<td>26.1</td>
<td>0.39</td>
<td>0.6 (0.2–1.7); 0.38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parental problems</th>
<th>Girls n = 37</th>
<th>Boys n = 89</th>
<th>p</th>
<th>OR (95% CI); p adjusted for age and diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental mental disorders</td>
<td>55.6</td>
<td>35.2</td>
<td>0.03</td>
<td>2.2 (0.9–5.5); 0.09</td>
</tr>
<tr>
<td>Parental substance abuse</td>
<td>40.1</td>
<td>34.1</td>
<td>0.34</td>
<td>1.1 (0.4–2.6); 0.87</td>
</tr>
<tr>
<td>Parental criminality</td>
<td>8.6</td>
<td>16.1</td>
<td>0.22</td>
<td>0.4 (0.1–1.6); 0.20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age on admission to adolescent forensic unit</th>
<th>Girls n = 37</th>
<th>Boys n = 89</th>
<th>p</th>
<th>OR (95% CI); p adjusted for age and diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at first hospitalization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years (mean, sd)</td>
<td>15.5 (1.2)</td>
<td>14.0 (2.2)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>*** 2.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–6 years</td>
<td>29.7</td>
<td>12.8</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>7–12 years</td>
<td>67.6</td>
<td>44.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13–17 years</td>
<td>43.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delinquency</th>
<th>Girls n = 37</th>
<th>Boys n = 89</th>
<th>p</th>
<th>OR (95% CI); p adjusted for age and diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe physically violent behavior</td>
<td>94.6</td>
<td>92.1</td>
<td>0.48</td>
<td>1.2 (0.2–6.6); 0.82</td>
</tr>
<tr>
<td>Non-violent criminal behavior</td>
<td>32.4</td>
<td>53.9</td>
<td>0.02</td>
<td>0.4 (0.2–1.0); 0.05</td>
</tr>
<tr>
<td>Sexually aggressive behavior</td>
<td>21.6</td>
<td>29.2</td>
<td>0.26</td>
<td>0.6 (0.2–1.6); 0.28</td>
</tr>
<tr>
<td>In court as defendant</td>
<td>18.9</td>
<td>19.1</td>
<td>0.60</td>
<td>0.7 (0.2–2.0); 0.46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Victimization</th>
<th>Girls n = 37</th>
<th>Boys n = 89</th>
<th>p</th>
<th>OR (95% CI); p adjusted for age and diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim of violence in the home</td>
<td>41.7</td>
<td>34.1</td>
<td>0.28</td>
<td>1.8 (0.7–4.3); 0.21</td>
</tr>
<tr>
<td>Victim of violence elsewhere</td>
<td>16.2</td>
<td>13.5</td>
<td>0.44</td>
<td>0.8 (0.2–2.5); 0.65</td>
</tr>
</tbody>
</table>

(Continued)
Due to the high non-response on the self-report scales, we first analyzed whether those not responding to the self-report scales differed from those who did not complete the NAS and those who did complete the NAS. We found that those who did not complete the NAS were more likely to not complete the HS ($p < 0.05$). The SSI ($p < 0.05$), and those who did not complete the NAS were more likely to not complete the HS ($p < 0.05$).

Table 1. (Continued).

<table>
<thead>
<tr>
<th>Victim of sexual abuse</th>
<th>OR (95% CI)</th>
<th>$p$ adjusted for age and diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls $n = 37$</td>
<td>37.8</td>
<td>3.4</td>
</tr>
<tr>
<td>Boys $n = 89$</td>
<td>3.4</td>
<td>37.8</td>
</tr>
<tr>
<td>Before court as plaintiff</td>
<td>8.1</td>
<td>6.7</td>
</tr>
<tr>
<td>Self-harm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suicide attempt(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls $n = 37$</td>
<td>45.9</td>
<td>5.6</td>
</tr>
<tr>
<td>Boys $n = 89$</td>
<td>5.6</td>
<td>45.9</td>
</tr>
<tr>
<td>Self-mutilation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls $n = 37$</td>
<td>75.7</td>
<td>18.0</td>
</tr>
<tr>
<td>Boys $n = 89$</td>
<td>18.0</td>
<td>75.7</td>
</tr>
<tr>
<td>Alcohol and/or substance abuse</td>
<td>27.0</td>
<td>32.6</td>
</tr>
<tr>
<td>Promiscuous behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls $n = 37$</td>
<td>22.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Boys $n = 89$</td>
<td>1.1</td>
<td>22.2</td>
</tr>
<tr>
<td>Medical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant somatic illness</td>
<td>21.6</td>
<td>13.5</td>
</tr>
<tr>
<td>Antipsychotic medication</td>
<td>73.0</td>
<td>59.6</td>
</tr>
</tbody>
</table>

Notes: OR = Odds ratio; CI = Confidence interval.

Table 2. Psychiatric diagnoses (ICD-10) among girls and boys admitted to adolescent forensic unit due to severe violent behaviors. (%) As the patients may have 1–3 diagnoses, the percentages summarized exceed 100.

<table>
<thead>
<tr>
<th>F10–19 Mental and behavioral disorders due to psychoactive substance use</th>
<th>Girls ($n = 37$)</th>
<th>Boys ($n = 89$)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>F20–29 Schizophrenia, schizotypal, and delusional disorders</td>
<td>8.1</td>
<td>2.2</td>
<td>0.15</td>
</tr>
<tr>
<td>F30–39 Mood disorders</td>
<td>48.6</td>
<td>24.7</td>
<td>0.009</td>
</tr>
<tr>
<td>F40–49 Neurotic, stress-related, and somatoform disorders</td>
<td>4.5</td>
<td>14.6</td>
<td>0.12</td>
</tr>
<tr>
<td>F50–59 Behavioral syndromes associated with physiological disturbances and physical factors (in this sample, the eating disorder diagnoses)</td>
<td>8.1</td>
<td>–</td>
<td>0.02</td>
</tr>
<tr>
<td>F60–69 Disorders of adult personality and behavior</td>
<td>8.1</td>
<td>12.4</td>
<td>0.36</td>
</tr>
<tr>
<td>F70–79 Mental retardation</td>
<td>10.8</td>
<td>10.1</td>
<td>0.57</td>
</tr>
<tr>
<td>F80–89 Disorders of psychological development</td>
<td>8.1</td>
<td>19.1</td>
<td>0.09</td>
</tr>
<tr>
<td>F90–99 Behavioral and emotional disorders</td>
<td>62.2</td>
<td>64.0</td>
<td>0.49</td>
</tr>
</tbody>
</table>

the SSI ($p < 0.05$), and those who did not complete the NAS were more likely to not complete the HS ($p < 0.05$).

Due to the high non-response on the self-report scales, we first analyzed whether those not responding to the self-report scales differed from those
responding, regarding family background and parent-related issues, treatment history, history of criminal and delinquent behavior, of being victim to crime, of self-harming behaviors, somatic illnesses, and use of antipsychotic medication. No systematic associations between these variables and non-response to self-report scales were detected (data not shown). Those not responding to the SCL-90 were rated higher on the SAVRY sum score [23.8 (8.9) vs. 19.7(7.5), \(p = 0.03\)], otherwise non-response to self-report scales was not associated with SAVRY or BPRS scores. Regarding diagnoses, it was noted that not having a diagnosis in the conduct disorder group (F90–99) was associated with non-response in CDI, NAS, HS, and SSI \((p = 0.05)\), otherwise no systematic associations were detected (data not shown).

In bivariate analysis, the girls and the boys received comparable mean (sd) sum scores on the CDI [51.0 (2.7) vs. 51.8 (2.6), \(p = 0.22\)]. However, when diagnosis of schizophrenia, diagnosis of ED, and age that differed according to sex were controlled for, the difference in CDI mean scores was statistically significant; boys had higher mean score on the CDI \((p = 0.008)\).

The girls and the boys did not differ on the Hopelessness Scale, but the girls had higher ratings on suicidal ideation on the Beck Scale for Suicidal Ideation. The median of the SSI sum score was 3.0 for the girls and 1.17 for the boys, \(p < 0.001\) (Mann–Whitney U test). Controlling for confounding (age, diagnosis of schizophrenia, diagnosis of ED) in Cox regression analysis confirmed that that the risk for high suicidal ideation was higher among the girls than among the boys (OR 2.1, 95% CI 1.2–3.8).

In the subscales of the SCL-90, girls scored a higher median in depression (11.0 vs. 3.0, \(p = 0.001\)), psychosis (5.5 vs. 1.1, \(p = 0.05\)), interpersonal sensitivity (7.0 vs. 3.0, \(p = 0.02\)), and hostility (4.5 vs. 2.0, \(p = 0.03\)), when bivariate associations were studied using Mann–Whitney U test. However when age, diagnosis of schizophrenia, and diagnosis of ED were controlled for in Cox regression, there were no differences according to sex in the SCL-90 subscales among the violent girls and boys. The SCL subscales were further dichotomized to clinically significant symptom levels vs. subclinical symptoms. When confounding (age, diagnosis in schizophrenia group, diagnosis of ED) was controlled for in logistic regression, sex was not associated with clinically significant symptom levels in any of the SCL-90 subscales.

The girls and the boys had comparable ratings of hostility/aggression on all NAS subscales. The mean (sd) score on hostile/aggressive thoughts was 37.8 (7.1) for the girls and 36.4 (5.5) for the boys \((p = 0.36)\), on the emotion scale it was 34.0 (7.9) vs. 33.1 (5.4) \((p = 0.57)\), and on the behavior scale it was 36.6 (9.1) vs. 35.0 (6.0) \((p = 0.39)\). Controlling for confounding (age, diagnosis of schizophrenia, diagnosis of ED) confirmed that there were no sex differences in any scale of hostility/aggression.
Episodes requiring use of restraint and length of stay

The girls had more numerous episodes of restraint than the boys (Table 3).

When age, diagnosis in schizophrenia group, and diagnosis of ED were controlled for in Cox regression analysis, it was confirmed that the likelihood of being restrained was greater among the girls (OR 1.93, 95% CI 1.19–3.12).

The median length of stay in the study unit was 182 days for the girls and 153 days for the boys ($p = 0.39$). Controlling for age, diagnosis of schizophrenia, and diagnosis of eating disorder confirmed that there was no sex difference in length of stay.

Protective factors

The SAVRY includes, in addition to risks items, a protective score of six positive protective factors, all scored present (1) or absent (0). Each of them was equally often rated ‘present’ among the girls and the boys: Pro-social involvement 32.4% vs. 26.6%, $p = 0.31$; strong social support 48.6% vs. 42.3%, $p = 0.33$; strong attachments and bonds 63.9% vs. 50.6%, $p = 0.13$; positive attitude to intervention/authority 29.4% vs. 22.5%, $p = 0.30$; strong commitment to school 25.0% vs. 17.1%, $p = 0.23$; and resilient personality traits 8.6% vs. 6.8%, $p = 0.50$. The girls and the boys received comparable sum scores on the protective factor of the SAVRY (mean (sd) girls 2.0 (1.5), boys 1.7 (1.2) ($p = 0.31$). Controlling for confounding did not change this finding.

Discussion

The girls admitted to an adolescent forensic unit due to physically and/or sexually violent behaviors more often suffered from schizophrenia group disorders (F20–29) than the boys admitted to the same unit due to similar behaviors. In addition, the girls more often presented with eating disorders, and disorders of psychological development (autism spectrum) tended to be less common among them, but otherwise the various psychiatric diagnoses were evenly distributed between the sexes.

Table 3. Episodes of restraint among girls and boys admitted to an adolescent forensic unit due to violence against others.

<table>
<thead>
<tr>
<th></th>
<th>% (n) with no restraint</th>
<th>M (sd)</th>
<th>min; max</th>
<th>Quartiles</th>
<th>% (n) with more than 100 restraint episodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls (n = 37)</td>
<td>32.4 (12)</td>
<td>51.2 (101.8)</td>
<td>3</td>
<td>0; 420</td>
<td>0.33</td>
</tr>
<tr>
<td>Boys (n = 89)</td>
<td>55.1 (49)</td>
<td>7.8 (23.7)</td>
<td>0</td>
<td>0; 154</td>
<td>0.40</td>
</tr>
</tbody>
</table>
Compared to adolescent psychiatric inpatients at large, adolescents admitted to this tertiary-level service due to physically violent or sexually coercive behaviors suffered many times more commonly from schizophrenia group disorders (F20–29), pervasive developmental disorders (F80–89), personality disorders (F60–69), and disorders in the conduct disorder group (F90–99), and clearly less frequently from mood disorders (Kaltiala-Heino, 2004). These disorders have been associated with increased risk of violence in adolescents and young adults (Mannuzza et al., 2009; Siponmaa et al., 2001; Sourander et al., 2006; Söderström et al., 2005; Taylor, 2008). Among the girls admitted to this adolescent forensic unit due to violence problems, the prevalence of schizophrenia group disorders was particularly high, both in general and compared to boys admitted for similar reasons.

Schizophrenia is known to have an earlier onset among males than among females, although in the presence of a family history of mental illness, this gender difference disappears (Esterberg, Trotman, Holtzman, Compton, & Walker, 2010). Family history of mental disorders was particularly pronounced among the most severely ill schizophrenic girls in the present sample (Kaltiala-Heino et al., 2013). Males with schizophrenia tend to present with more negative symptoms than females (Esterberg et al., 2010), and psychosis has been suggested to increase the risk of violence even more in females than in males (Taylor & Bragado-Jimenez, 2009). In line with these findings, schizophrenia group diagnoses were more common among violent girls than boys. Boys with early onset schizophrenia group disorders may require treatment in a secure unit less frequently than girls, perhaps due to different (more negative) symptom profile.

The violent girls were less likely than the boys to have a history of non-violent offending. The context of the girls’ violent behavior is not antisocial development at large. Rather, severe trauma emerges as an important factor to consider. The prevalence of experiences of abuse was very high in the present sample, but the girls were still more likely than the boys to have been victims of sexual abuse. Trauma has been suggested to be a more important precursor of girls’ aggression than antisocial personality features (Odgers et al., 2005). Our findings support this. Victimization in sexual domain may be particularly distorting for female adolescent development. History of sexual abuse and promiscuous behavior among the violent girls are further noticeable from the point of view of sexual health. Sexual abuse in childhood is known to predispose to repeated sexual trauma, compromised sexual health in the form of drifting repeatedly into emotionally unsatisfactory and abusive relationships, neglecting contraception and being incapable of protecting oneself from sexually transmitted diseases and teen pregnancy (Colman & Widom, 2004; Saewyc, Magee, & Pettingell, 2004). Early motherhood in girls displaying as severe developmental difficulties as in the study sample risks cross-generational continuity of negative developmental trajectories and marginalization. Particular attention should be paid to the sexual health and intimate relationship skills of girls with severe violence problems.
The violent girls presented with more suicidal ideation than the boys, and hence with more numerous suicide attempts and more common self-harming behaviors, as well as promiscuous behavior, which particularly in this age group can be seen as a form of self-harm or at least self-neglect. These may suggest low self-appreciation, low self-esteem, and self-hatred, which in turn may be associated with (sexual) trauma. Victimization to maltreatment in childhood has been associated with negative self-associations, inappropriate feelings of guilt, and low self-esteem (van Harmelen et al., 2010), and these may in turn predispose the child to developing mental disorders and suicidality. Sexual abuse in childhood is a risk factor for suicidal behavior (Molnar, Berkman, & Buka, 2001). Suicidal tendencies have also been shown to be particularly common among criminally offending adolescent girls (Abram et al., 2008). Suicidal behavior has been associated especially with reactive aggression, particularly in young people (Turecki, 2005). We have previously reported that among the most severely disturbed girls in the study unit, reactive violence is the predominant type of violent behavior (Kaltiala-Heino et al., 2013). It is important to pay attention to the risk of suicide among violent girls, perhaps by focusing on management of impulse control problems.

The girls and the boys did not differ as to whether there were positive factors in their lives, protective factors regarding risk of violence. Six protective items were rated, as part of the SAVRY violence risk assessment, that were similarly distributed among the girls and the boys, who both also had a mean score of only two protective items present. The most often found protective factors in both girls and boys were strong attachments and bonds, strong social support, and pro-social involvement. Even if this analysis did not provide gender-specific entries for treatment, these protective factors might be helpful for treatment planning. Strong attachment and bonds may help in building psychotherapeutic treatment relationships, being suggestive of capacity to bond in general, and positive social support is likely to promote commitment to treatment as well.

When age and the diagnoses that were differently distributed among sexes were controlled for, the violent girls did not differ from the violent boys regarding psychotic symptoms, violence risk, depression, hopelessness, hostility/anger, or on the nine scales of the SCL90. The psychopathology profiles of girls and boys are generally expected to differ, with girls displaying more internalizing symptoms and boys externalizing psychopathology. Among severely violent adolescents, gender differences in psychopathology profiles disappear. Violent girls resemble violent boys, both displaying excessive psychopathology.

However, despite comparable histories of violence, violence risk ratings, and symptom profiles, in inpatient care the girls far more frequently displayed behaviors requiring physical or even mechanical restraint, to prevent harm to others or the adolescent herself (often both). This held true after controlling for gender differences in diagnoses. According to the Finnish Mental Health Act, mechanical restraint is allowed if other measures are inadequate to prevent...
violent or suicidal behavior. In the study unit, physical restraint may be applied as an early intervention, well before actual damage to persons is inflicted (Kaltiala-Heino, Berg, Selander, Työläjärvi, & Kahila, 2007; Kaltiala-Heino et al., 2013), but nevertheless it illustrates that the girls more frequently and persistently displayed uncontrollable behaviors requiring physical restraint by the ward personnel. Girls seem to benefit less from the structured environment (Kaltiala-Heino et al., 2007) of a security ward. Treatment approaches need to be developed to better meet the needs of these girls. The present study suggests that the approaches should take into account a combination of severe psychiatric disorders, trauma, impulse control problems, suicidality, and sexual health. Antisocial people tend to calm down with outward limits while schizophrenia does not cure itself within structures and restrictions.

It may finally be that girls, having once overstepped a certain boundary, run right out of control and stop trying. This could be a societal explanation. A female perpetrator of violence may more easily become an outcast as this is the point when the rules lose their validity. To the best of our knowledge, females are across cultures required to behave less aggressively than males, and to be more submissive both as to societal norms and in social interactions. Transgressing the limits of expectations may be a more serious disruption in females, requiring, on the one hand, more severe disorders and trauma to occur, and resulting, on the other hand, in a more persistent and severe loss of behavioral controls, perhaps because a violent female is more stigmatized than a violent male. The more frequent and severe suicidal behavior in violent girls could also be related to stigmatization and letting go after having overstepped the boundaries, illustrating self-hatred due to having lost status that seems hopeless to regain.

**Methodological considerations**

The strength of the present study is comprehensive information systematically collected on all adolescents in the study unit. The study unit is one of the two adolescent forensic units in Finland and admits adolescents from all over the country. The subjects are likely to be representative of adolescents with the most severe problems with aggression management and violent behaviors related to mental disorders.

Background information collected routinely in the study unit focuses on the type of information recorded in the psychiatric and child welfare files of adolescents with severe aggression problems, information which during the evaluation period is also specifically elicited from the adolescent, her/his parents, the child welfare authorities, and other informants in the adolescent’s network. However, the information concerning parents may not always be as detailed as would be desirable for scientific research. We did not have access to the parents’ medical records and thus, cannot report their psychiatric diagnoses even if the adolescent’s files recorded that parent(s) had received
psychiatric treatment. The figures for parental mental disorders are likely underestimates, but this seems unlikely to affect the sex differences that were the primary interest of the present study.

Information collected with self-report instruments (CDI, SCL-90, NAS, HS, SSI) was lacking for many adolescents as they are not always cooperative or able to complete self-report questionnaires. Thus, the data collected with these instruments may need to be interpreted with caution. However, their use in the analyses is supported by the findings that non-response in self-report scales was not systematically associated with family, treatment, crime, being a victim to crime, or health history, or scores in professional-rated symptom scales. The self-report instruments used have been chosen in the study unit based on assumed clinical helpfulness, to find entries for interventions. They are unfortunately not chosen to test any scientific theory of aggression.

The limitations of the present study are due primarily to the small number of subjects. On the other hand, the continuous data collection embedded in the unit’s clinical routines allows studying all the adolescents admitted over the time the unit has been in operation.

We have dealt with episodes of restraint as indications of uncontrollable behaviors in the adolescents. However, as we considered in reporting previous results on most severely aggressive girls in the study unit (Kaltiala-Heino et al., 2013), it cannot be excluded that violent behaviors could be provoked by institutional means. In clinical practice it is usually assumed that violent behaviors represent patients’ psychopathology and demoralizing or traumatizing life histories. However, prisons, forensic hospitals, and like institutions dedicated to managing clients with aggression problems have been criticized for the unnecessary wielding of power (Holmes & Murray, 2011). Humiliating institutional practices could trigger (justified?) aggression in patients. But why should it be particularly the female patients who react excessively? Perhaps girls institutionalized due to violent behaviors provoke more aggression in the staff than aggressive boys, so that instead of successful early de-escalation, interactions with staff enhance girls’ aggression, and this again provokes staff all the more. Finding evidence for or against these considerations is beyond the possibilities afforded by the present data.

Conclusion

Girls requiring admission to security ward due to violent behaviors are more sexually traumatized, more suicidal and self-harming, and less generally antisocial than boys admitted under similar circumstances. They display similar symptom and risk profiles as do violent boys. During treatment however, their aggressive behaviors are more difficult to manage and subside more slowly. Treatment approaches that respond to the special needs of aggressive girls are required.
References


