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International Journal of Law and Psychiatry xxx (2016) xxx-xxx



Contents lists available at ScienceDirect

### International Journal of Law and Psychiatry



### A 3-year follow-up study of Swedish youths committed to juvenile institutions: Frequent occurrence of criminality and health care use regardless of drug abuse

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#### ARTICLE INFO

Available online xxxx

Keywords: Institutionalized adolescents ADHD Substance use Follow-up Criminal recidivism Inpatient care

#### ABSTRACT

This 3-year follow-up study compares background variables, extent of criminality and criminal recidivism in the form of all court convictions, the use of inpatient care, and number of early deaths in Swedish institutionalized adolescents (N = 100) with comorbid substance use disorders (SUD) and Attention-Deficit/ Hyperactivity Disorder (ADHD) (n = 25) versus those with SUD but no ADHD (n = 30), and those without SUD (n = 45). In addition it aims to identify whether potential risk factors related to these groups are associated with persistence in violent criminality. Results showed almost no significant differences between the three diagnostic groups, but the SUD plus ADHD group displayed a somewhat more negative outcome with regard to criminality, and the non-SUD group stood out with very few drug related treatment episodes. However, the rate of criminal recidivism was strikingly high in all three groups, and the use of inpatient care as well as the number of untimely deaths recorded in the study population was dramatically increased compared to a age matched general population group. Finally, age at first conviction emerged as the only significant predictor of persistence in violent criminality with an AUC of .69 (CI (95%) .54–.84, p = .02). Regardless of whether SUD, with or without ADHD, is at hand or not, institutionalized adolescents describe a negative course with extensive criminality and frequent episodes of inpatient treatment, and thus requires a more effective treatment than present youth institutions seem to offer today. However, the few differences found between the three groups, do give some support that those with comorbid SUD and ADHD have the worst prognosis with regard to criminality, health, and untimely death, and as such are in need of even more extensive treatment interventions.

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### 1. Introduction

Adolescents, who are institutionalized due to externalizing and disruptive behaviors, constitute a vulnerable group among which many individuals describe a negative development with regard to both mental health and criminality. Up to about two thirds of these adolescents show signs already during their childhood of mental health problems

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http://dx.doi.org/10.1016/j.ijlp.2016.09.004 0160-2527/© 2016 Elsevier Ltd. All rights reserved. (Copeland, Miller-Johnson, Keeler, Angold, & Costello, 2007; Grisso, 2008), not seldom in form of the neurodevelopmental disorder Attention-Deficit/Hyperactivity Disorder (ADHD; i.e., showing several symptoms of inattention and/or hyperactivity and impulsivity), which for many persists into adulthood (Rösler et al., 2004; Young et al., 2011). Different figures for the prevalence of ADHD in criminal justice settings have been presented ranging from as much as almost 50% to 68% in Scandinavian studies on youth populations (Dalteg & Levander, 1998; Haapasalo & Hämäläinen, 1996), to somewhere between 24% and 41% in international studies on adult populations (Eyestone & Howell, 1994; Vitelli, 1996). Although a recent meta-analysis concluded that a more realistic figure is that 30% of incarcerated adolescents and 26% in adult prison populations are affected, this is as much as a fivefold increase of ADHD in the former and a 10-fold in the latter population

Please cite this article as: Ståhlberg, O., et al., A 3-year follow-up study of Swedish youths committed to juvenile institutions: Frequent occurrence of criminality and health care ..., *International Journal of Law and Psychiatry* (2016), http://dx.doi.org/10.1016/j.ijlp.2016.09.004

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compared to estimates for the general population (Young, Moss, Sedgwick, Fridman, & Hodgkins, 2015). A recent review on the other hand found a considerable amount of mental health needs among detained adolescents covering a broad array of mental health problems, with Conduct Disorder (CD; i.e., a persistent and serious pattern of norm or rule breaking behaviors covering aggression towards others, destruction of property, and or deceitfulness and theft) as the most frequent condition (a mean prevalence of about 46%) followed by Substance Use Disorders (SUDs; i.e., the continuing use of a substance, or several substances, despite significant and extensive substance-related problems) close to the former (a mean prevalence of about 45%) (Colins et al., 2010).

In several studies ADHD has emerged as a significant risk factor related to the development of antisocial behaviors during adolescence (Gittelman, Mannuzza, Shenker, & Bonagura, 1985; Mannuzza, Klein, Konig, & Giampino, 1989), and later on to an adult antisocial and criminal lifestyle and to criminal recidivism (Dalsgaard, Mortensen, Frydenberg, & Thomsen, 2013), especially in combination with CD (von Polier, Vloet, & Herpertz-Dahlmann, 2012). There is even compelling evidence that CD, especially with early age of onset, regardless of ADHD is a serious risk factor associated with a more criminal lifestyle and a heightened risk for criminal recidivism (Farrington et al., 1990; Gelhorn, Sakai, Price, & Crowley, 2007). Results are, however, not conclusive since some studies have found that ADHD even in the absence of CD increases the risk for both substance abuse and an antisocial lifestyle during adolescence, with increased risk for persistent criminal behavior into adulthood (e.g., Mannuzza, Klein, & Moulton, 2008), while others have established that ADHD without CD is not associated with any increased adult criminality (Mordre, Groholt, Kjelsberg, Sandstad, & Myhre, 2011; Satterfield et al., 2007). There is even a recent study on 283 German young male adult prisoners showing that ADHD did not predict criminal recidivism, despite the fact that there was retrospectively established a ten-fold increase in the prevalence of childhood ADHD among the participants compared to community samples (Grieger & Hosser, 2012).

Substance use is another coexisting problem among adolescents with externalizing behavior problems and delinquency, commonly acting as a risk factor for later serious antisocial behavior and violent offending (Loeber & Farrington, 2000). Adolescent-onset alcohol abuse has for example emerged as a risk factor, especially in combination with childhood CD. In a study Howard, Finn, Jose, and Gallagher (2012)), showed that individuals with this condition displayed a higher degree of antisocial behavior problems than those with either CD without alcohol abuse, only alcohol abuse or neither of these two problem behaviors. Early onset of substance abuse has also been associated with aggression and criminal recidivism (Gustavson et al., 2007), and Stenbacka and Stattin (2007) found that illicit drug use during adolescence was, independent of other factors, a risk factor in itself for adult criminality. A similar result was found in a study of 500 serious adult criminal offenders where juvenile drug use was the only early onset delinquency behavior that was significantly related to all studied types of criminal career outcomes (DeLisi, Angton, Behnken, & Kusow, 2015). Persistent high-level offenders also engage in drug use much more often compared to both rare offenders and those with decreasing offending (Wiesner, Kim, & Capaldi, 2005). This pattern of a more negative outcome in individuals with both criminality and substance use in their late adolescence/early adulthood, leading to higher rates of criminal recidivism and more substance-related social problems than among comparable groups without this dual problem, has even been termed "the worst of both worlds" by Walters (2014).

Alcohol and drug abuse are not only associated with later criminality, but also with multiple adverse outcomes such as illness and poverty (Larm, Hodgins, Larsson, Molero-Samuelson, & Tengström, 2008), and even increased mortality rates and suicide (Engqvist & Rydelius, 2006). This emerged clearly in a 30-year follow-up study where 1992 individuals treated at a clinic for substance misusing adolescents were compared to 1992 randomly selected but age, gender and birthplace matched individuals from the general population, as the former group showed significantly elevated figures not only for criminal convictions but also for poverty, physical illness, mental illness, substance use, and relative risk of death (Hodgins, Larm, Molero-Samuelson, Tengström, & Larsson, 2009).

There is nowadays also convincing evidence that ADHD and SUD often coexist, which in many cases is synonymous with a more severe SUD and an increased risk for developing other psychiatric disorders (Wilens, 2007). Studies of adolescents and adults with SUD have consistently found an over-representation of ADHD ranging from 25% to 50% (Wilens & Biederman, 2006), and as high as 35% to 71% with childhood-onset and persistent ADHD among adult alcoholics (Wilens, 2007). Recent research comparing individuals with comorbid ADHD and SUD with individuals with either only SUD or only ADHD, found that the group with comorbid ADHD and SUD consequently showed a more negative outcome; for example, they had more often been in compulsory care, more imprisoned, presented more childhood ADHD symptoms, and performed poorer on tests measuring general intelligence and executive functions (Bihlar Muld, Jokinen, Bölte, & Hirvikoski, 2013). To judge from a large Australian birth cohort study, which followed participants up to the age of 21 years, there is no doubt about the negative effect of co-existing mental health and alcohol use disorders leading to a larger amount of and more severe behavioral problems (Salom et al., 2014).

Existing knowledge therefore supports the notion that comorbid ADHD and SUD constitutes a severe condition, which is associated with a clinically more problematic picture and a negative process that goes beyond what is generally the case with only ADHD and SUD alone. Individuals with co-existing ADHD and SUD could then be expected to describe a course that is characterized by more persistent antisocial and violent behaviors, more severe abuse, and more physical and mental illness. And even worse, when in combination with delinquency the course might take a more negative trajectory, since adolescents with these two conditions are characterized by more risk factors and less protective factors within such areas as schooling, use of free time, relationships, family, and general skills than are youth with only criminality (van der Put, Creemers, & Hoeve, 2014). Thus, externalizing and juvenile adolescents with coexisting ADHD and substance use could be expected to describe a much worse course than comparable youth with only abuse without ADHD or no abuse at all.

### 1.1. Aims

The overall purpose of this study is to map criminal patterns and health care needs in a follow-up study of three groups of institutionalized adolescents with different problem constellations and to evaluate potential risk factors related to these groups. More specifically this study aims:

- 1) To compare the patterns of violent and general criminality, both previous and during follow-up, in adolescents committed to youth institutional care with i) combined SUD and ADHD, ii) SUD without ADHD, and iii) no SUD;
- 2) To compare number of inpatient health care episodes and early deaths in these three groups during the whole study period due to register based follow-up data;
- 3) To examine whether potential risk factors related to group status (e.g., age at onset of drug abuse, a diagnosis of ADHD) are associated with persistence in violent criminality.

### 2. Subjects and methods

### 2.1. Subjects

This study group consists of adolescents committed to care at four state-run specialized youth institutions in the southwest of Sweden

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