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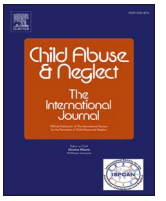

Lifetime psychiatric diagnoses among adolescents with severe conduct problems – A register-based follow-up study

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ABSTRACT

Background: Both delinquency and out-of-home care (OOHC) are associated with a wide spectrum of psychiatric disorders. Reform schools (RS) are Finnish OOHC institutions for adolescents with severe conduct problems.
Objective: We investigated the prevalence of psychiatric diagnoses among individuals with a history of RS placement.
Participants and setting: The data consisted of individuals placed in a RS on the last day of the years 1991, 1996, 2001, 2006 or 2011 ($N = 1074$) and a matched comparison group ($N = 5313$).
Methods: Information on lifetime psychiatric diagnoses, grouped into eight categories, was collected from the nationwide health care registry. The follow-up time ranged from 17 to 44 years.
Results: Among RS population, 59.5 % had some psychiatric diagnosis, which was 12-fold compared to general population peers (hazard ratio HR = 12.4). The most prevalent categories were Conduct disorders and/or ADHD (30.7 %, HR = 41.5), Substance use disorders (29.3 %, HR = 16.8,), Other childhood disorders (8.6 %, HR = 11.9) and Personality disorders (10.9 %, HR = 11.6) followed by Mental retardation (6.4 %, HR = 8.4), Schizophrenia spectrum disorders (9.7 %, HR = 7.9), Affective disorders (17.9 %, HR = 7.3), and Disorders of psychological development (6.1 %, HR = 4.4). All differences were statistically significant ($p < .001$).
Conclusions: RS background associates with an excess of psychiatric disorders, which adds to the burden of other known risk factors for adult age well-being. Effective screening and intervention for psychiatric problems should be available both during the RS placement and after-care.

1. Introduction

Finland is country located in Northern Europe, population 5.5 million. It is a member state of the European Union (EU). Per capita economical output is equal to that of other EU countries. Finland is one of the five Nordic countries, together with Sweden, Norway, Denmark and Iceland. Nordic countries are known for their extensive state welfare system, which has been built to provide decent living conditions for all residents regardless of personal socioeconomical status. Finland was ranked the first in the current World Happiness Report, and also all other Nordic countries are in the top ten (Helliwell et al., 2022).

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Finnish reform schools (RS) are foster care institutions for youth with behavior problems like severe school problems, conduct problems, substance use and delinquency (Kitinoja, 2005). The RS system is a part of the child welfare, not juridical or correctional systems. In line, the overall aim of the RS placement is rehabilitation, not punishment. The goal is to support the adolescents in becoming independent and to prevent further psychosocial problems. RS placement provides safe structures for both physical and psychological well-being, including access to both public and special health care and different types of recreational activities like sports and other hobbies. More, education is a priority. Compared to results from similar international institutes, the Finnish RS has reached this aim well: Since the 1980s, all adolescents placed to RS have completed compulsory education. The average age of youth placed in RS is 15.5 years, ranging typically from 13 to 17. Placement due to child welfare legislation ends at the age of consent – 18 years in Finland – but some adolescents choose to stay in RS later. The main reason for living in RS setting in early adulthood is to complete vocational or secondary education (Manninen, 2013).

Most of the adolescents placed in RS have a long history of various psychosocial difficulties. RS placement usually takes place when prior child welfare activities have failed in providing the adolescent an adequate and safe environment. In Finland, around 19,000 children (1.6 % of the 0 to 20-year-old age group) were placed in out-of-home care (OOHC) in 2020, while only 250–280 (1.4 %) of them were placed in RS (THL, 2021).

Recent review studies on psychiatric morbidity among OOHC youth have confirmed an excess of psychiatric problems, ranging from internalizing to externalizing spectrum (Baker, Kurland, Curtis, Alexander, & Papa-Lentini, 2007; Viner & Taylor, 2005; Vinnerljung & Hjern, 2014; Vinnerljung & Sallnäs, 2008). Likewise, there is also robust evidence on the association between delinquency and mental health problems. The results from a high-quality review focusing on adolescents in juvenile detention and correctional facilities showed high prevalence of psychiatric problems, e.g. conduct disorder (CD, 53 %/53 % male M/female F), major depression disorder (MDD, 11 %/29 % M/F), attention deficit and hyperactivity disorder (ADHD, 12 %/18 % M/F) and psychotic illness (3 %/1 % M/F) (Fazel, Doll, & Långstr, 2008). Another review reported the mean prevalence of any psychiatric disorder among detained male adolescents to be 70 %; 46 % for CD, 45 % for substance use disorder (SUD), 20 % for oppositional defiant disorder (ODD), 16 % for anxiety disorders, 13 % for ADHD, 12 % for MDD, 10 % for post-traumatic stress disorder (PTSD), and 1 % for psychotic disorders (Colins et al., 2010).

In line with these findings, previous small-scale studies among RS adolescents suggest an excess of both externalizing and internalizing spectrum symptoms. In a study of 87 RS adolescents, 89 % had at least one psychiatric diagnosis, and the most common disorders were CD (76 %), mood disorders (50 %) and SUD (40 %) (Lehto-salo, Närhi, Ahonen, & Marttunen, 2009). Likewise, another study with a sample of 48 RS adolescents confirmed an excess of both emotional and behavioral problems compared to general population (Manninen et al., 2010). However, as the previous RS studies are based on small-scale data from specific facilities, these findings cannot be considered to provide reliable information for evidence-based care policy.

It is likely that as the array of mental health problems is wide, and the prevalence of numerous risk factors is high among the RS population, many of the psychiatric disorders reach a diagnosable level at a younger age than in general population. Early onset is often associated with poor prognosis (Sellers et al., 2019), and especially with severe mental health issues like psychosis, early treatment might prove important (Lally et al., 2016). Recent registry studies have shown that RS background associates with adult age criminality (Manninen, Suvisaari, Marola, & Aaltonen, 2017), issues in reproductive health (Lehti, Gissler, Suvisaari, & Manninen, 2015) and premature death (Manninen, Pankakoski, Gissler, & Suvisaari, 2015), which are all outcomes intertwined with mental health problems.

For developing the RS care system, it is crucial to have comprehensive information on the psychiatric problem spectrum. We set out to assess the psychiatric diagnoses with an extensive data set derived from national registry. Many of the earlier studies are cross-sectional, but the design of this study will add new longitudinal information on the mental health prognosis of the RS population. This study will contribute to the existing knowledge by exploring RS population's psychiatric morbidity with a comprehensive sample of five full cohorts and register-based follow-up data.

The study had three specific aims. The first aim was to assess the prevalence of different psychiatric disorders among the RS population, and to compare the results to those from a matched general population comparison group. The second aim was to compare the age of diagnosis onset between the RS and general populations. The third aim was to assess possible time trends by comparing the prevalence numbers between five cohorts of adolescents residing in RS in 1991, 1996, 2001, 2006 and 2011.

2. Methods

2.1. Sample and procedure

The study design was a register-based follow-up. The RS sample ($N = 1074$, M/F 697/377) consisted of five RS cohorts picked from the Child Welfare Register, which includes information about all Finnish children placed in OOHC since 1991. Selection criterion was placement in a RS on the last day of year 1991, 1996, 2001, 2006 or 2011. If the same subject was present in two cohorts, the entry was deleted from the latter. A general population comparison group ($N = 5313$) was collected from the Finnish Central Population Register. For each RS individual, five comparison individuals (four when more were not available) were obtained. The selection method was exact matching, in which gender, age, and place of birth (municipality) were used as matching criteria. Place of birth was used for controlling race/ethnicity, though the proportion of immigrants among these cohorts in Finland is very small compared to most European countries. For 1017 RS subjects five controls were found, but for 57 (5 %) RS cases only four matched controls were located, as the proband had been born in a small municipality. Year of birth of the participants ranged from 1973 to 2000. Registry data includes all entries until 31.12.2017, which translates to a registry follow-up time ranging from 17 to 44 years (average 30 years). Study

sample information is presented in Supplement table A.

Information on lifetime psychiatric diagnoses was acquired from the Care Register for Health Care, which includes information on disorder type and time of first diagnosis derived from national specialized health care and inpatient care. The Finnish health care registry information has been shown to be reliable (Sund, 2012), and The Care Register for Health Care is widely used in health and policy research.

The diagnoses were assigned into eight diagnosis categories based on the guidelines by World Health Organization (World Health Organization WHO, 1994); 1) CD and ADHD, 2) SUD, 3) Affective disorders, 4) Personality disorders, 5) Schizophrenia spectrum disorders, 6) Mental retardation, 7) Disorders of psychological development, and 8) Other childhood disorders. The diagnoses for anxiety, PTSD and eating disorders were left out of the data, as the differences between ICD versions 8, 9 and 10 made it impossible to combine these diagnoses to a comparable category. More, the name of category six - Mental retardation - has later been replaced with a more appropriate term *Neurodevelopmental disorders* in the ICD-11. However, as the diagnostic criteria in this study were derived from the previous editions of the ICD, we decided to use the former term for clarity. ICD-diagnoses included in the diagnosis categories are presented in Supplement table B.

This study was a part of After Reform School Study (ARSS) project, which has been approved by the ethical committee of Finnish Institute for Health and Welfare (documents from meetings in 2/2019, 1/2016, 9/2015 and 8/2011).

2.2. Statistical methods

Outcome variables used in the analyses were the eight diagnosis categories and age at the time of diagnosis. The diagnosis categories had a 0/1 value and more than one diagnosis category per individual was possible. Cox regression analysis was used for assessing the differences in the risk of diagnoses. This analysis estimates the association between predictor variables and time to an outcome. In this study, Cox regression analysis was stratified on matched pairs, thus the model is first estimated within the pairs after which the results are pooled. We compared 1) RS and comparison groups, 2) males and females within both groups, and 3) males and females in the RS group only (without stratification). The statistical analyses were performed with R software. The smoothed hazard function plots were done using Muhaz add-on package (R Core Team, 2019).

3. Results

Among the RS group, the risk for any diagnosis was 12-fold compared to the comparison group. The hazard ratios (HR) for diagnosis categories ranged from 4 to 42: among RS subjects, the risk for a CD and ADHD category was 42-fold, for SUD category 17-fold and for Personality disorders 12-fold compared to their matched peers. The prevalence numbers and corresponding HRs are presented in detail in Table 1.

The gender-specific differences between RS and comparison groups were also significant in all diagnosis categories (Table 2.). The highest HRs for RS males were found in CD and ADHD (36×), SUD (15×), Personality disorders (14×) and Other childhood disorders (13×). Among RS males, the risk for receiving any diagnosis was 13-fold compared to their matched peers. For females, the highest HR differences between RS and comparison groups were found in CD and ADHD (66×), SUD (21×), Schizophrenia (18×), and Other childhood disorders (11×). Compared to matched peers, the risk for any diagnosis was 12-fold for RS females.

Among the RS population only, males were more prone to receive any psychiatric diagnosis during the follow-up (HR = 1.42, $p < .001$). RS males had significantly more CD and ADHD diagnoses (HR = 1.53, $p < .001$), Mental retardation (HR = 4.28, $p < .001$) and Disorders of psychological development (HR = 2.71, $p = .003$) than RS females, while Affective disorders were significantly more prevalent among females (HR = 1.71, $p < .001$).

In the RS group, 33.5 % had diagnoses of two or more categories, compared to 2.8 % among the comparison group. Further, 16.3 % of RS subjects had diagnoses in three or more categories compared to 0.8 % in the comparison group.

Table 1
The prevalence of the diagnosis categories and hazard ratios between Reform School and comparison groups.

Diagnosis category	RS		C			95 % CI		p
	N	%	N	%	HR	Low	High	
Conduct disorders and ADHD	329	30.7	46	0.9	41.5	29.7	57.8	<0.001
Substance use disorders	314	29.3	117	2.2	16.8	13.3	21.3	<0.001
Affective disorders	192	17.9	158	3	7.3	5.8	9.1	<0.001
Personality disorders	117	10.9	55	1	11.6	8.3	16.3	<0.001
Schizophrenia spectrum	104	9.7	74	1.4	7.9	5.8	10.7	<0.001
Mental retardation	69	6.4	40	0.8	8.4	5.7	12.4	<0.001
Disorders of psychological development	65	6.1	75	1.4	4.4	3.1	6.1	<0.001
Other childhood disorders	92	8.6	38	0.7	11.9	8.1	17.4	<0.001
Any disorder	638	59.5	397	7.5	12.4	10.7	14.4	<0.001

RS = Reform School, C = comparison group, CI = Confidence Interval, HR = Hazard Ratio for the RS group.

Table 2
The prevalences and hazard ratios between Reform School and comparison group populations in the eight diagnosis categories, divided by gender.

Category	Males		C	%	HR	95 % CI		p
	RS	%				Low	High	
Conduct disorders and ADHD	236	33.9	35	1	36.2	25.0	52.3	<0.001
Substance use disorders	219	31.5	91	2.6	15.4	11.8	20.2	<0.001
Affective disorders	104	14.9	84	2.4	7.4	5.4	10.0	<0.001
Personality disorders	79	11.4	31	0.9	13.8	8.9	21.2	<0.001
Schizophrenia spectrum	68	9.8	61	1.8	6.1	4.2	8.6	<0.001
Mental retardation	61	8.8	32	0.9	9.3	6.0	14.2	<0.001
Disorders of psychological development	54	7.8	61	1.8	4.5	3.1	6.5	<0.001
Other childhood disorders	55	7.9	21	0.6	12.9	7.8	21.4	<0.001
Any disorder	444	63.8	273	7.9	12.8	10.7	15.4	<0.001

Diagnosis category	Females	%	C	%	HR	95 % CI		p
	RS					Low	High	
Conduct disorders and ADHD	93	24.7	11	0.6	65.6	30.4	141.5	<0.001
Substance use disorders	95	25.2	26	1.4	21.2	13.4	33.8	<0.001
Affective disorders	88	23.3	74	4	7.2	5.2	9.9	<0.001
Personality disorders	38	10.1	24	1.3	8.8	5.2	15.0	<0.001
Schizophrenia spectrum	36	9.5	13	0.7	17.8	8.9	35.9	<0.001
Mental retardation	8	2.1	8	0.4	4.9	1.9	13.1	0.001
Disorders of psychological development	11	2.9	14	0.7	3.9	1.8	8.6	0.001
Other childhood disorders	37	9.8	17	0.9	10.6	6.0	18.9	<0.001
Any disorder	194	51.5	124	6.6	11.5	9.0	15.0	<0.001

RS = Reform School, C = comparison group, CI = Confidence Interval, HR = Hazard Ratio for the RS group.

3.1. Age of diagnosis

The risk for the first diagnosis peaked for both RS males and females at about 15 years of age and remained high until the end of the follow-up time. Early onset was especially common with diagnoses of SUD, Affective disorders, Personality disorders and Schizophrenia spectrum disorders. In contrast, RS subjects diagnosed with Mental retardation, Disorders of psychological development or Other childhood disorders received the diagnosis later than their matched peers. No difference was found in the age when CD and ADHD were first diagnosed. The age at the time of the first diagnosis is shown in Fig. 1. Fig. 2 shows the HR rates for different diagnosis categories for RS and comparison groups, both genders together.

3.2. Cohort differences

Last, we compared the different cohorts in order to assess trends over time. CD/ADHD diagnoses among RS population peaked in the early 2000's and remained high since, while in the comparison group, these diagnoses appeared to become steadily more prevalent

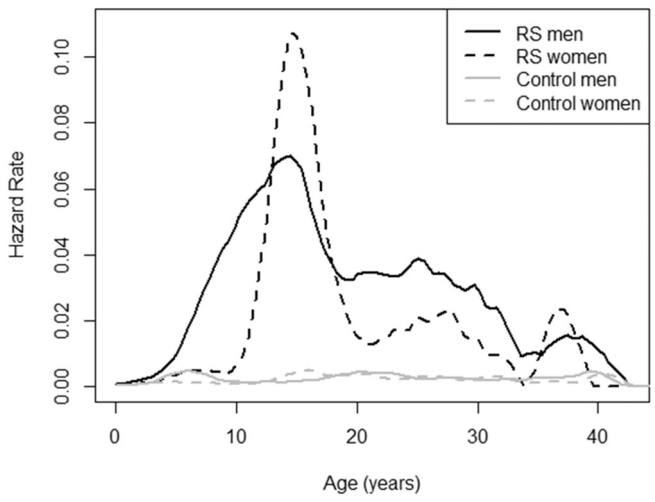

Fig. 1. The Hazard ratio (HR) for the first psychiatric diagnosis during follow-up among RS and comparison group populations divided by gender.

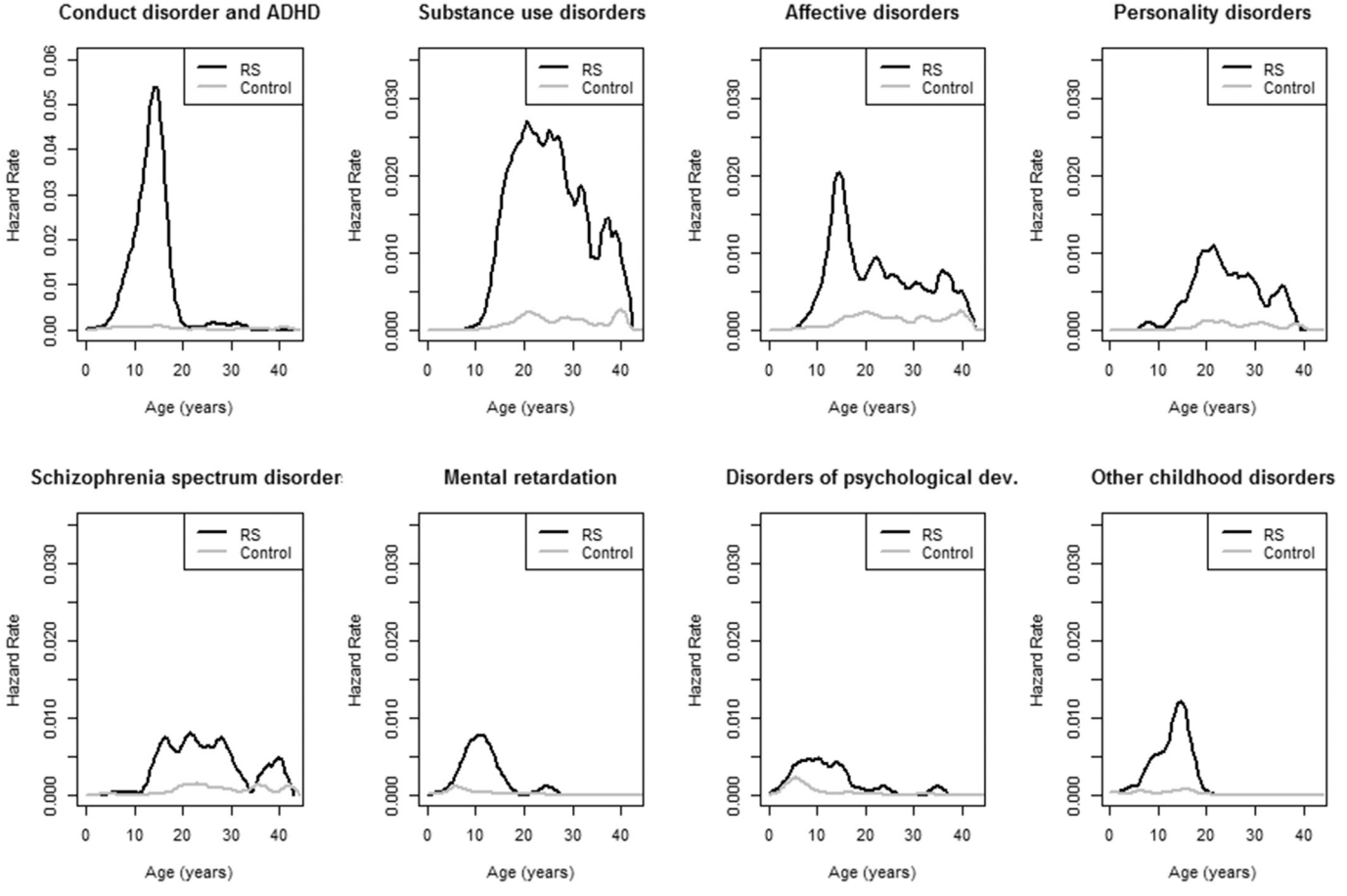

Fig. 2. The Hazard ratio (HR) for diagnosis categories during follow-up among RS and comparison group populations.

over time. The prevalence of SUD was stable over cohorts in both groups. Likewise, there were no major cohort differences in the prevalence for Affective disorders in either group. The prevalence of Personality disorders diminished over the years among the RS subjects, while there were no major differences among the comparison group. For Schizophrenia, there were no major changes in either group over time. Mental retardation diagnoses diminished over the years among the RS subjects, while there were no major differences among comparison group. On the contrary, the prevalence of Disorders of psychological development appeared to increase over time for both RS and comparison group. The prevalence of Other childhood disorders increased over the years among the RS population, while among the comparison group there were no major changes. More, all diagnoses pooled together among the RS population, the 1991 cohort appeared to have the smallest number of diagnoses, while the 2001 cohort had the highest prevalence.

4. Discussion

The aim of this study was to assess the psychiatric morbidity among RS population with a register-based follow-up setting. Compared to general population peers, the RS placement associates with a significantly higher risk for a psychiatric diagnosis, with HRs ranging from four (Disorders of psychological development) to 45-fold (CD/ADHD). All diagnosis categories were significantly more prevalent in the RS group compared to general population. Among the RS group, the risk for psychiatric diagnosis peaked during adolescence, but also remained high over the entire follow-up time. No clinically significant cohort differences were found.

Approximately one third of the RS group was diagnosed with CD or ADHD. This was a somewhat expected finding, as severe conduct problems are the reason for RS placement. Our CD/ADHD rates were somewhat lower than some earlier prevalence estimates, where about 50 % of adolescents in juvenile and correctional facilities have been diagnosed with CD (Fazel et al., 2008).

Despite the differences in magnitude, the age of diagnosis did not differ in the CD/ADHD category. At large, ADHD is prone to underdiagnosing (Sayal, Prasad, Daley, Ford, & Coghill, 2018), but the situation has become better during the past decades (Getahun et al., 2013), hypothetically resulting from increased awareness and better recognition of the condition. Screening for psychiatric problems has not originally been a priority in the Finnish RS, as the care guidelines have previously been derived from social sciences. CD and ADHD are known to associate with a high risk for personality disorders, affective disorders, and SUD (Farrington, Ttofi, & Coid, 2009; Sourander et al., 2007). In addition to psychiatric problems, they also associate with other types of later life adversities like educational problems, unemployment, and criminality (Sayal et al., 2018). Thus, standardized screening should be provided in both RS and other OOHC contexts.

Despite the overall decreasing trend in substance use among adolescents in Europe (Kraus et al., 2018), according to RS staff substance abuse problems have become more severe among RS adolescents (Pekkarinen, 2017). Our findings confirmed the excess of SUD, as one third of the RS population received a SUD diagnosis during our follow-up. This result was somewhat anticipated, based on both previous studies and due to the fact that these types of issues are profoundly intertwined with conduct problems leading to RS placement decision. Our previous ARSS project study revealed an excess of substance related premature deaths and suicides (Manninen et al., 2015), and our current findings confirm that substance abuse is one of the most focal problems affecting the poor prognosis of RS adolescents. Effective, targeted interventions should begin early, and active prevention and harm reduction should continue in aftercare and adulthood. From a positive viewpoint, RS environment facilitates effective control on current substance use, which opens a potential window of opportunity for effective rehabilitation during placement.

Further, our results showed that RS background associates also with an excess of affective disorders. Affective disorders were more common among females than males in the RS group. This is congruent with previous findings (Abrantes, Hoffmann, & Anton, 2005; Fazel et al., 2008; Grande et al., 2012). However, affective disorders among RS males were also prevalent. Previous research has shown that internalizing problems especially among males are not always noticed by the RS personnel (Manninen et al., 2010), and thus do not receive adequate care. This is unfortunate, as treating comorbid depression diminishes also externalizing problems (Jacobs et al., 2010).

The risk for personality disorders was ten-fold among the RS population compared to the comparison group, among both females and males. This is congruent with previous findings showing that personality disorders are common among offending populations (Arola et al., 2016; Yu, Geddes, & Fazel, 2012). Namely, CD is a well-known precursor for antisocial personality disorder (Hill, 2003).

Schizophrenia spectrum disorder was diagnosed in 8 % the RS group, confirming a previous ARSS study results with a slightly different inclusion criterion (Manninen, Latvala, Torniainen-Holm, Suvisaari, & Lindgren, 2018). RS males received a diagnosis significantly earlier than comparison group males. Early schizophrenia spectrum disorder onset is associated with more severe illness and worse prognosis, as the illness increases obstacles for reaching normative developmental tasks. Psychotic symptoms are easily unnoticed, if the treatment staff doesn't specifically ask about them (Riecher-Rössler et al., 2007). Thus, special attention and standardized screening is needed for early intervention and possibly better prognosis.

The higher rate of mental retardation among RS group is also congruent with previous knowledge about connections between conduct problems and limitations in cognitive abilities such as language difficulties and low IQ (Anderson, Hawes, & Snow, 2016; Kroll et al., 2002; Romi & Marom, 2007). Our results also confirm previous findings on neuropsychological deficits among the RS population (Lehto-salo et al., 2009; Manninen et al., 2013). Later morbidity among the RS population in mental retardation, disorders of psychological development and other childhood disorders can partly be explained by general population individuals speculatively having a more supportive childhood family that is active in getting treatment for their children if problems arise. Also, early conduct problems can obscure other psychiatric problems.

RS population appears to suffer from psychiatric comorbidity. Around two thirds among the RS group had a diagnosis from at least two different categories, compared to less than one in ten among the comparison group. Further, one in six with a history of RS placement had a psychiatric diagnosis from three or more different categories compared to <1 % of the comparison group. These rates

reflect numbers discovered among US detained youths; 66 % were diagnosed with at least one disorder, 43 % with two or more (Washburn et al., 2008).

Taken together our results on prevalence, the continuous high risk of psychiatric problems is a feature that demonstrates the lifetime persistent disadvantaged position of this group. In most diagnosis categories, RS subjects are also diagnosed at a younger age than subjects in the comparison group, which in turn affects the odds for proper education, prosocial relationships, and self-sustained living at large.

Some cohort differences were also found. At large, all categories pooled together, the results show an increase in diagnosis prevalence over time. This finding might reflect better awareness and screening of psychiatric problems. Among the RS population, the prevalence of mental retardation appears to diminish cohort by cohort, while the corresponding numbers among the comparison group are stable. We interpret this as a favorable sign, which indicates that the welfare system has nowadays better awareness in screening adolescents for psychiatric problems before placement. The percentages of SUD appear to be stable over RS cohorts, which is somewhat contradictory to the clinical experience. This discrepancy might be due to the polarization of both psychiatric and social problems.

4.1. Strengths and limitations

This is the first comprehensive, register-based follow-up study regarding psychiatric morbidity among individuals with RS background. Strengths of this study include a long follow-up time and a representative sample with five full cohorts with basically no attrition. Despite this, it is plausible that there are missing entries, both due to underdiagnosing and other errors during the workflow. More, our prevalence rates are based on specialized health care, and information from general practitioner or occupational health clinics are not included. However, as these limitations apply also to our comparison group, the differences in HRs are considered reliable. Second, eating and anxiety disorders – including PTSD – had to be left out of the data, because with these disorder types the differences between ICD-8, 9 and 10 are so remarkable that it was not possible to combine these diagnoses to a comparable category with a reliable procedure. An excess of PTSD has been verified among adolescents about to exit child welfare systems (Keller, Salazar, & Courtney, 2010), and omitting this important diagnosis was unfortunate. Third, it is also likely that there are individuals suffering from a psychiatric condition who have not received a diagnosis. Especially individuals with SUD have a high risk of drop-out from treatment network (Brorson, Ajo Arnevik, Rand-Hendriksen, & Duckert, 2013). However, the HRs between RS and general population groups can be considered valid, as the high treatment drop-out risk in many of the disorders applies similarly to both RS and comparison group. Fourth, controlling known mental health risk factors like socio-economic variables or genetic risk might have been of interest, but our data did not provide adequate information sources.

In addition, it can be argued that the placement in the RS system per se might be a risk factor for adolescents' mental health, for example due to negative group effects and isolation from general population peers. Assessing care-related questions for prognosis must be done carefully, by combining personal attributes, placement types, intervention methods and mental health outcome factors, preferably in a longitudinal study setting. This was not possible with our data set. More, the specific aim of this paper was to provide reliable information on the prevalence of mental health problems among the RS population. Despite these shortcomings, our results on prevalence are crucial for developing both RS care and aftercare services.

Based on our study, we welcome future follow-up studies addressing anxiety and especially PTSD among OOHC and delinquent populations. One step further, it would also be interesting to assess how the mental health needs of RS or similar populations are met in the adulthood. More, as this study included lifetime diagnoses, a more delicate approach, which differentiates diagnoses received during different life periods - namely pre, during and after foster care - would help to understand the etiology of these problems among this special subgroup of adolescents better.

Taken together, our study confirmed that individuals with both foster care and adolescent age conduct problems background have an excess risk for psychiatric disorders. Thus, standardized screening procedures and effective evidence-based treatment should be implemented in the day-to-day care provided by RSs and corresponding OOHC facilities. More, the elevated risk for psychiatric problems continues in adulthood, which calls for screening and treatment routines also during the aftercare. The onset of psychiatric illnesses is likely to be a time of crisis for any individual. In the foster care population, numerous risk factors and problems often begin to cumulate early in life. Effective early intervention is important for preventing a vicious circle, in which problems nurture problems. Foster care placement should be considered as a window of opportunity for ambitious treatment before adulthood. RS placement provides safe housing, education and basic needs for healthy adolescence. Especially by controlling substance abuse, the odds for effective mental health intervention outcomes are favorable. As some adolescents with conduct problems show a weak response to traditional psychotherapy, a wide spectrum of intervention methods for psychiatric problems should be available. There's a growing body of literature showing promising results for arts-based methods (Fancourt & Finn, 2019), also in RS environment (Känkänen, Pääjoki, & Manninen, 2021). In addition, it appears likely that by nurturing general resilience factors – e.g. social support, social skill training and everyday problem solving abilities – the risk for developing mental health problems can be alleviated.

Declaration of competing interest

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chiabu.2022.105765.

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