SJDR Scandinavian Journal of Disability Research
Established by the Nordic Network on Disability Research

Special Education and the Risk of Committing Serious Crime in Finland

RESEARCH

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STOCKHOLM UNIVERSITY PRESS

ABSTRACT

Our aim was to study the complex relationship between participation in special education and the risk of committing a serious crime among girls and boys, as well as the role of family and parental background and continuation to upper secondary education in this relationship. We used register-based data including all individuals born between 1989 and 1994 who were residing in Finland. The risk of committing a serious crime between the ages of 15 and 18 was analysed using a Cox proportional hazards model.

The results suggest an association between participation in special education and higher criminality among both girls and boys, particularly for offences against property and sexual offences. Family and parental background explained part of this association. Continuation to upper secondary education accounted for the association among girls but not among boys. Among students in upper secondary vocational education and training, the highest levels of criminality were found among individuals who had been in special education only at this stage.

From a disability studies perspective, the findings may reflect structural processes that shape pathways into criminalisation, rather than individual deficits. Well-designed and properly implemented special education could potentially function as a protective factor rather than a risk.

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KEYWORDS:
criminality; serious crime; special education; youth; risk factors

TO CITE THIS ARTICLE:
Rinne, Hanna, Teemu Kaskela, Johanna Korkeamäki, Annika Hokkanen, and Tuuli Pitkänen. 2026. "Special Education and the Risk of Committing Serious Crime in Finland." *Scandinavian Journal of Disability Research* 28(1):622–637.DOI:https://doi.org/10.16993/sjdr.1406

DOI: 10.16993/sjdr.1406

INTRODUCTION

Young people who are identified as disabled, neurodivergent, or in need of special education often face cumulative structural and institutional inequalities across the life course, which disability studies understand as arising not only from individual impairments but also from broader societal and institutional factors (Macdonald and Peacock 2026). While the prevalence of neurodevelopmental conditions and other disabilities among offending populations has been widely documented, criminological research has paid relatively little attention to disability as a social and structural phenomenon (MacDonald and Peacock 2026; Thorneycroft and Asquith 2021). Existing studies have largely approached disability as an individual risk factor, with less consideration given to the role of marginalization, exclusion, and inequality in shaping life outcomes. Likewise, the relationship between special education participation and later criminality remains underexplored.

Studies of young people with disabilities have shown that pathways into criminalisation are often shaped by unmet support needs, poverty, adverse family circumstances, and repeated contact with welfare and justice institutions (Baldry et al. 2018; Macdonald and Peacock 2026). In criminal justice contexts, failures to recognise disability as an equality issue can create disabling barriers, particularly when cognitive and learning differences are insufficiently accommodated (Gormley and Watson 2021). Moreover, labelling processes, stigma, and discourses of vulnerability may reinforce control-oriented responses rather than providing appropriate support (Hollomotz 2013; Thorneycroft and Asquith 2021). From this perspective, disability is understood not as a cause of offending but as a social condition that intersects with structural inequalities and institutional responses over the life course, including educational practices such as identification, placement, and support in special education.

Norm-breaking behaviour is common among youth, particularly among boys, but serious criminality remains rare (Posey, Timmer and Ramirez 2024). Although youth crime overall has declined in developed countries (van der Laan et al. 2021), offending has become increasingly concentrated among a smaller group of young people who commit both more frequent and more serious crimes (Sivertsson, Nilsson and Bäckman 2021). In Finland, the most common form of punishment is a fine, and other sanctions are used only in cases of more severe crimes or persistent offending.

Youth crime causes immediate negative consequences, but it can also be linked to criminal careers in adulthood, as most habitual adult offenders have already shown signs of criminal behaviour in their youth (McAra and McVie 2022). Preventing a criminal lifestyle should therefore begin as early as possible, and various support measures should be effectively targeted at young people who experience cumulative disadvantage (Posey, Timmer and Ramirez 2024).

Schools constitute a key institutional context in young people's lives, and educational practices such as special education may provide important support while also shaping later educational trajectories and opportunities. Students in need of special education are identified through the allocation of additional resources based on disabilities, difficulties, or disadvantages (OECD 2005). From a disability studies perspective, this educational categorisation is not merely a response to individual learning needs but also an institutional process that may involve labelling and shape participation, belonging, expectations, and future opportunities (Niemi and Mietola 2023).

Special education refers to instruction designed to support students with various learning or developmental challenges. Its definition and implementation vary across countries. In Finland, children aged 7–16 attend public comprehensive schools for nine years, during which students are entitled to additional support for learning if necessary. Decisions regarding special education are primarily based on a pedagogical assessment, sometimes supplemented by psychological or medical evaluations (Kirjavainen, Pulkkinen and Jahnukainen, 2016; Niemi and Mietola 2023). The curriculum can be individualised. Students may study in special schools, special classes, small groups, or be integrated into general classrooms. Approximately 7–11% of Finnish students receive special support, with the majority being boys (SF 2025). The most common reasons include delayed development, developmental language disorder, emotional or social difficulties, and physical or neurological impairments (SF 2011).

Prior research has found an association between special education and incarceration, particularly in North America (Pyle et al. 2016). Evidence from the Nordic countries remains

limited, despite their longstanding commitment to educational equity. A Finnish study (Kivivuori and Salmi 2009) found that students in special education reported 1.5–2 times more delinquent behaviour, particularly in car theft, fighting, and running away from home.

Adverse family conditions, such as low parental education and income, unemployment, divorce, and financial difficulties, have been shown to be associated with increased participation in special education (Kivivuori and Salmi 2009; Knight et al. 2025; Parsons and Platt 2013). Children from challenging family backgrounds may be more vulnerable within the education system, which can, in turn, increase their risk of marginalization. These same family and parental factors, especially their accumulation, also correlate with youth criminality (Coyne et al. 2013; Knaappila et al. 2019; Laajasalo et al. 2025; Posey, Timmer and Ramirez 2024).

Educational pathways may further influence the association between special education and criminality. Admission to upper secondary education has been shown to have a protective effect against youth offending (Anderson 2014; Huttunen et al. 2023). However, students with special education background are less likely to begin upper secondary education, are overrepresented in vocational tracks, and experience higher dropout rates (Foreman-Murray, Krowka and Majeika, 2022; Kirjavainen, Pulkkinen and Jahnukainen 2016). These precarious educational pathways often lead to unemployment or NEET status, thereby increasing vulnerability to social exclusion and marginalization (Macdonald and Peacock 2026; Ringbom et al. 2024).

AIMS

By using population-level register data, this study aimed to examine how special education, family background, and educational pathways intersect with involvement in serious crime among Finnish girls and boys. The specific research questions were:

1) Does the criminality of girls and boys who have participated in special education in basic education differ from that of their peers? To what extent do family and parental background account for this difference?
2) Does continuation to upper secondary education account for the association between a special education background and criminality?
3) Does the association between special education background and criminality differ between those who participated in special education in basic education and those who participated in special education only in upper secondary vocational education and training?

METHODS

We used register-based cohort data including all individuals born between 1989 and 1994 and residing in Finland. The study population was obtained from Statistics Finland and was further supplemented with the joint application register of the Finnish National Board of Education. The joint application register provided information on applications to upper secondary education, completion or dropout from basic education, and participation in special education among those who completed basic education.

We included individuals residing in Finland at ages 14 and 15 (N = 396,612). We excluded those who lived in the self-governing province of Åland (n = 2,083), those who had never participated in the joint application process until and including 2015 (n = 4,526), and those whose education was arranged by activity areas (n = 536), a form of teaching meant for students with a severe intellectual disability, other disability, or serious illness.

In this study, serious criminality refers to offences that result in imprisonment or community sanctions. Information on crimes included crimes of persons who were sentenced in court. We restricted our criminality analysis to crimes that had led as an independent act or as part of sentence to imprisonment or community sanctions, including combination sentence, unconditional imprisonment, conditional imprisonment, juvenile punishment, community service, and monitoring sentence. We included only offences and excluded infractions. We selected the first offence(s) from the beginning of the follow-up period. In addition to total crime, we examined offences against property, narcotic offences, driving under the influence, aggravated violent crime, and sexual offences. Individuals could be included in more than one offence-specific analysis. Some offence types were excluded in certain analyses due to small numbers.

Three study designs were used (Table 1).

STUDY DESIGN 1

Study design examined whether the criminality of those who had participated in special education in basic education differed from that of their peers and whether family and parental background factors explained this difference. Individuals' criminal activity was followed from their 15th birthday to their 19th birthday. Follow-up might have ended before an individual's 19th birthday because of their first offence leading to a conviction (n = 5,884), emigration (n = 1,170), or death (n = 251). The final size of the study population was 389,467. The mean follow-up time was 3.98 years.

Categories of the special education were: 1) general education, 2) special education, partly individualised curriculum, 3) special education, mainly or entirely individualised curriculum and, 4) dropped out. For offence-specific analyses, special education groups were combined and dropouts excluded due to small numbers.

STUDY DESIGN 2

Study design 2 examined whether continuation to upper secondary education explained the association between participation in special education and criminality. Follow-up began from 15 August in the year the study population turned 16. This is the time when most people have graduated from basic education and started upper secondary education. The follow-up ends as in study design 1. Compared to study design 1, we excluded those who had dropped out from basic education (n = 778) and those who had been censored out of the data between the start dates of study designs 1 and 2: offenders (n = 740), migrants (n = 116), and deceased (n = 33). The final size of the study population was 387,800, with a mean follow-up time of 2.81 years.

STUDY DESIGN 3

Study design 3 examined whether the timing of special education was associated with criminality. The study population and the follow-up period were the same as in study design 2, except that the analysis was restricted only to those who had continued to upper secondary vocational education and training (VET). Information on special education in VET was retrieved from the registers of Statistics Finland. Information on special education was available only for VET. The final number of the study population was 141,905, with a mean follow-up time of 2.81 years.

The special education attainment was classified as follows: 1) general education in both basic education and VET, 2) special education only in basic education, 3) special education only in VET, and 4) special education in both basic education and VET.

BACKGROUND VARIABLES

Family and parental background information as well as information on continuing to upper secondary education were retrieved from the registers of Statistics Finland. Missing values were coded as missing in all variables and treated as a separate class.

Family background variables included year of birth, language, degree of urbanisation, family type, household income per consumption unit at the end of the year in which a person turned 14, and number of internal migrations at ages 0–6 and 7–14.

Parental background (education, socioeconomic status, and employment status) for mother and father were highly correlated. We selected the education of the mother for the analysis. If the information was missing, it was replaced by the father's education. Other variables were mother's death and father's death before the end of the year in which the person turned 14 and mother's age at birth. The categories of variables are presented in more detail in Table 2.

Continuation to upper secondary education in August of the year when a person turned 16 was classified as general upper secondary education, VET, or neither in that autumn.

STATISTICAL ANALYSIS

Crime rates per 10,000 person-years with 95% confidence intervals were calculated on crimes leading to imprisonment or community sanctions, stratified by special education background. In addition, rates were calculated for all family and parental background factors together for those in special and general education.

Cox proportional hazard models and their 95% confidence intervals were used to determine whether the association between special education and criminality could be explained by family or parental background. We fitted the models separately for girls and boys. We analysed total criminality as well as the most prevalent types of offences separately. We used Stata 17 for the analysis.

In study design 1, we first adjusted for year of birth (Model 1) and then for all family and parental background factors one at a time (data not shown). In model 2, we adjusted for all family background factors at the same time, and in model 3, we further adjusted for all parental background factors.

In study design 2, we fitted model 1 with the year of birth and model 2 with all the family and parental background factors. In model 3, we further adjusted for upper secondary education.

In study design 3, we fitted the same models as in study design 1.

ETHICS APPROVAL

The study protocol was approved by the Ethics Committee of the Rehabilitation Foundation. The data used in the study were fully pseudonymised before access. Finnish legislation permits the use of register data without informed consent, but individuals have the right to opt out of the secondary use of their data. The data were accessed through permissions from the Social Insurance Institution of Finland and Statistics Finland.

RESULTS

In total, 5% of girls and 8% of boys had participated in special education in basic education (Table 1, study design 1). The proportion of those who had dropped out of basic education was 0.2% for both. The serious crime rate per 10,000 was 10 among girls and 66 among boys. Crime rates were highest among school dropouts and lowest among those in general education.

Table 1 Distribution of study population, number of offenders, and crime rate (per 10,000) with 95% confidence intervals by special education background for girls and boys in study designs 1–3.

	GIRLS					BOYS				
	ALL		OFFENDERS			ALL		OFFENDERS		
	N	%	N	CRIME RATE PER 10,000 (95% CI)		N	%	N	CRIME RATE PER 10,000 (95% CI)	
Study design 1										
General education	181,848	95	625	9	(8–9)	182,671	92	4,031	56	(54–57)
Special education, partly individualised	5,596	2.9	59	27	(21–34)	8,872	4.5	573	165	(152–180)
Special education, mainly individualised	3,374	1.8	43	32	(24–43)	6,328	3.2	484	197	(180–215)
Dropped out	349	0.2	9	65	(34–126)	429	0.2	60	382	(297–492)
All	191,167	100	736	10	(9–10)	198,300	100	5,148	66	(64–67)
Study design 2										
General education	181,709	95	560	11	(10–12)	182,121	92	3,549	70	(67–72)
Special education, partly individualised	5,588	2.9	53	33	(25–44)	8,770	4.4	474	193	(177–211)
Special education, mainly individualised	3,368	1.8	38	40	(29–55)	6,244	3.2	401	231	(210–255)
All	190,665	100	651	12	(11–13)	197,135	100	4,424	80	(78–82)
Study design 3										
General education in basic education and upper secondary VET	47,103	83	213	16	(14–18)	69,441	82	1,515	78	(74–82)
Special education only in basic education	1,124	2.0	6	19	(8–42)	2,043	2.4	95	167	(137–205)
Special education only in upper secondary VET	5,986	11	80	48	(38–59)	8,904	10	649	266	(246–287)
Special education in both	2,550	4.4	20	28	(18–43)	4,754	5.6	253	193	(171–219)
All	56,763	100	319	20	(18–22)	85,142	100	2,512	106	(102–110)

DOI: 10.16993/sjdr.1406

Compared to those in general education, students who participated in special education were less likely to reside in urban areas and more likely to come from single-parent families or have an unknown family status (Table 2). They had also more often experienced internal migration, belonged to low-income families, and had younger and less educated mothers. Additionally, their parents were more likely to be deceased.

Criminality was least common among Swedish speakers and children from nuclear families but most prevalent among those with an unknown family status. It was also more common among those who had moved frequently, belonged to low-income families, or had younger and less educated mothers, as well as among those with a deceased parent.

Table 2 Distribution (%) of family and parental background and severe crime rate (per 10,000) with 95% confidence intervals by special education background in basic education, girls and boys (study design 1).

BACKGROUND FACTOR (INDIVIDUAL'S AGE AT THE TIME)	GIRLS				BOYS			
	DISTRIBUTION (%)				DISTRIBUTION (%)			
	SPECIAL EDUCATION N = 8,970	GENERAL EDUCATION N = 181,848	CRIME RATE PER 10,000 (95% CI)		SPECIAL EDUCATION N = 15,200	GENERAL EDUCATION N = 182,671	CRIME RATE PER 10,000 (95% CI)	
Year of birth								
1989	13	16	11	(9–13)	14	16	69	(65–74)
1990	15	17	9	(8–11)	16	17	71	(67–76)
1991	17	17	8	(7–10)	18	17	66	(62–71)
1992	19	17	10	(8–12)	17	17	63	(58–67)
1993	18	17	10	(8–12)	17	16	66	(62–71)
1994	18	17	10	(8–11)	17	17	58	(54–63)
FAMILY BACKGROUND								
Language								
Finnish	88	92	10	(9–10)	89	92	64	(62–66)
Swedish	5	5	5	(3–8)	5	5	31	(26–37)
Other	7	4	15	(11–21)	5	3	149	(135–164)
Degree of urbanisation (14)								
Urban	59	64	10	(9–11)	53	65	66	(64–69)
Densely populated	21	18	10	(8–12)	22	18	67	(63–71)
Rural	20	17	8	(7–10)	25	17	61	(57–66)
Family type (14)								
Child from a nuclear family	63	74	6	(6–7)	65	75	47	(45–49)
Child of a single parent	27	21	17	(15–19)	26	20	104	(100–110)
Child from a blended family	5	4	15	(11–20)	5	4	118	(106–131)
Unknown	5	1	61	(48–77)	5	1.3	328	(297–363)
Internal migrations (0–6)								
0–1	90	93	9	(8–10)	91	93	62	(60–63)
2–3	7	6	18	(15–23)	6	6	94	(86–103)
4+	0.5	0.3	48	(26–88)	0.4	0.3	162	(117–225)
Missing	3	1	13	(8–22)	2	1.3	191	(166–218)
Internal migrations (7–14)								
0–1	94	96	9	(8–10)	94	96	62	(61–64)
2–3	6	4	23	(18–29)	6	4	133	(120–147)
4+	0.5	0.2	33	(15–74)	0.5	0.2	266	(200–355)
Household income per consumption unit (14)								
Lowest quartile	36	20	17	(15–19)	33	20	105	(100–111)
2nd quartile	23	21	9	(8–11)	24	21	64	(60–68)
3rd quartile	16	21	6	(5–8)	17	21	47	(44–50)
Highest quartile	9	21	3	(3–5)	10	22	31	(29–34)
Missing	17	17	13	(12–16)	17	17	84	(79–89)

(Contd.)

PARENTAL BACKGROUND								
Mother's age (at birth)								
Under 20	4	2	34	(25–45)	4	1.7	211	(188–237)
20–24	22	15	16	(14–19)	21	15	112	(106–118)
25–34	55	65	8	(7–9)	56	65	51	(49–53)
35+	14	15	7	(5–8)	15	15	45	(41–49)
Missing	6	3	16	(11–22)	5	3	16	(144–177)
Mother's education (7)								
Basic	42	29	16	(15–18)	39	29	97	(93–101)
Secondary	43	36	10	(8–11)	45	35	67	(64–70)
Tertiary	12	34	4	(3–5)	13	35	31	(29–34)
Missing	2	1	11	(6–19)	2	1.4	177	(154–203)
Mother deceased (0–14)								
No	99	99	10	(9–10)	99	99	65	(63–67)
Yes	1.3	0.7	11	(5–23)	1.3	0.8	116	(92–146)
Father deceased (0–14)								
No	96	98	9	(9–10)	96	98	64	(62–66)
Yes	4	2	26	(20–35)	4	2	131	(115–149)
Total	100	100	10	(9–10)	100	100	66	(64–67)

Next, we examined the association between a special education background and criminality. Hazard ratios indicate relative differences in criminality over time compared to the reference group.

Among girls, the overall level of criminality was more than three times higher among those who had participated in special education compared to those in general education (Table 3). There was no significant difference between those in partly and mainly individualised special education. However, those who had dropped out had an almost eightfold increase in criminality. Adjusting for family and parental background attenuated these differences—particularly among dropouts—but did not eliminate them. In the fully adjusted model, the hazard ratio remained approximately twofold for those with a history of special education and fourfold for those who had dropped out. Participation in special education was associated with a higher likelihood of property crimes but not with driving under the influence after controlling for all background variables.

Among boys, the unadjusted results for overall criminality were similar to those for girls. In the fully adjusted model, the level of criminality was 2.3 times higher for those who had participated in special education and four times higher for those who had dropped out. Across offence types, the largest differences were observed in sexual and property offences, while differences in narcotic offences were smaller.

In the autumn following the typical completion of basic education, only 1%–2% of students who had been in special education in basic education continued to general upper secondary education. In contrast, among those in general education, 61% of girls and 45% of boys continued to general upper secondary education. VET was more common among those girls with a background in special education, whereas this difference was not observed among boys. More than half of the students with a special education background had not yet continued to upper secondary education in the autumn following the typical completion of basic education.

Controlling for continuation to upper secondary education had a greater effect on criminality differences than controlling for family and parental background. Among girls, no differences in criminality by special education were observed once transition to upper secondary education was taken into account (Table 4). Among boys, after controlling for transition to upper secondary education, the hazard ratio for overall criminality was 1.5 for those who had participated in special education. Across offence types, the largest differences were observed in sexual and

GIRLS	OFFENDERS		MODEL 1[d]		MODEL 2[e]		MODEL 3[f]	
	N	CRIME RATE	HR	95% CI	HR	95% CI	HR	95% CI
All offences								
General education	625	9	1.00		1.00		1.00	
Special education, partly ind.	59	27	**3.10**	(2.37–4.05)	**2.32**	(1.77–3.04)	**1.98**	(1.51–2.59)
Special education, mainly ind.	43	32	**3.73**	(2.74–5.09)	**2.42**	(1.76–3.31)	**2.06**	(1.50–2.83)
Dropped out	9	65	**7.72**	(4.00–14.91)	**4.73**	(2.44–9.16)	**3.87**	(1.99–7.51)
Offences against property								
General education	183	3	1.00		1.00		1.00	
Special education[f]	44	12	**4.89**	(3.52–6.80)	**2.95**	(2.10–4.15)	**2.44**	(1.73–3.43)
Driving under the influence								
General education	232	3	1.00		1.00		1.00	
Special education	19	5	**1.69**	(1.06–2.70)	1.45	(0.90–2.32)	1.25	(0.78–2.01)
BOYS								
All offences								
General education	4031	56	1.00		1.00		1.00	
Special education, partly ind.	573	165	**3.02**	(2.76–3.29)	**2.55**	(2.33–2.79)	**2.33**	(2.13–2.55)
Special education, mainly ind.	484	197	**3.57**	(3.25–3.92)	**2.58**	(2.34–2.84)	**2.30**	(2.09–2.54)
Dropped out	60	382	**7.15**	(5.54–9.23)	**4.33**	(3.35–5.60)	**3.92**	(3.03–5.07)
Offences against property								
General education	1361	19	1.00		1.00		1.00	
Special education	438	74	**3.97**	(3.57–4.42)	**3.00**	(2.68–3.35)	**2.73**	(2.44–3.06)
Driving under the influence								
General education	1396	19	1.00		1.00		1.00	
Special education	273	46	**2.45**	(2.15–2.79)	**2.01**	(1.76–2.29)	**1.83**	(1.60–2.09)
Narcotic offences								
General education	211	3	1.00		1.00		1.00	
Special education	27	5	**1.55**	(1.04–2.31)	1.19	(0.79–1.79)	1.09	(0.72–1.64)
Aggravated violent crime								
General education	163	2	1.00		1.00		1.00	
Special education	39	7	**2.95**	(2.08–4,19)	**2.24**	(1.56–3.20)	**1.99**	(1.39–2.85)
Sexual offences								
General education	166	2	1.00		1.00		1.00	
Special education	58	10	**4.28**	(3.17–5.77)	**3.32**	(2.44–4.52)	**2.96**	(2.17–4.04)

Table 3 Number of offenders, crime rate, and adjusted hazard ratios (HR) and their 95% confidence intervals (CI)[a] for all offences and selected types of offences in ages 15–18 by special education background in basic education among girls[b] and boys[c] (Study design 1).

[a] Groups that differ statistically significantly from the reference group are shown in bold.

[b] Girls: general education N = 181,848, special education partly individualised N = 5,596, special education mainly individualised N = 3,374, dropped out N = 349.

[c] Boys: general education N = 182,671, special education partly individualised N = 8,872, special education mainly individualised N = 6,328, dropped out N = 429.

[d] Model 1: year of birth.

[e] Model 2: Model 1 + family background.

[f] Model 3: Model 2 + parental background.

[g] Include both partly and mainly individualised special education.

property offences, whereas differences in narcotic offences were explained by family and parental background.

Among girls who continued to VET, the highest levels of criminality were observed among those who had been in special education only in VET (HR = 2.99) (Table 5), followed by those who had been in special education both in general education and VET (HR = 1.76). Adjusting for family and parental background explained very little of the elevated levels of criminality. Girls who had been in special education only in basic education did not differ from those who had only been in general education.

GIRLS	OFFENDERS		MODEL 1[d]		MODEL 2A[e]		MODEL 2B[f]		MODEL 3[g]	
	N	CRIME RATE	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
All offences										
General education	560	11	1.00		1.00		1.00		1.00	
Special education, partly ind.	53	33	**3.04**	(2.29–4.03)	**1.95**	(1.46–2.59)	1.26	(0.95–1.69)	1.13	(0.85–1.51)
Special education, mainly ind.	38	40	**3.61**	(2.60–5.01)	**2.00**	(1.43–2.80)	1.31	(0.93–1.84)	1.08	(0.77–1.52)
Offences against property										
General education	161	3	1.00		1.00		1.00		1.00	
Special education[h]	36	14	**4.46**	(3.11–6.41)	**2.20**	(1.51–3.20)	**1.51**	(1.03–2.20)	1.21	(0,83–1.78)
Driving under the influence										
General education	222	4	1.00		1.00		1.00		1.00	
Special education	18	7	**1.62**	(1.00–2.63)	1.20	(0.74–1.95)	0.86	(0.53–1.42)	0.80	(0.48–1.32)
BOYS										
All offences										
General education	3549	70	1.00		1.00		1.00		1.00	
Special education, partly ind.	474	193	**2.79**	(2.54–3.07)	**2.17**	(1.97–2.40)	**1.52**	(1.38–1.68)	**1.49**	(1.35–1.64)
Special education, mainly ind.	401	231	**3.33**	(3.00–3.69)	**2.19**	(1.97–2.43)	**1.65**	(1.48–1.83)	**1.46**	(1.31–1.62)
Offences against property										
General education	1101	22	1.00		1.00		1.00		1.00	
Special education	326	78	**3.62**	(3.20–4.10)	**2.57**	(2.26–2.92)	**1.70**	(1.49–1.94)	**1.63**	(1.43–1.86)
Driving under the influence										
General education	1323	26	1.00		1.00		1.00		1.00	
Special education	250	60	**2.32**	(2.03–2.66)	**1.74**	(1.51–2.00)	**1.45**	(1.26–1.67)	**1.30**	(1.13–1.50)
Narcotic offences										
General education	206	4	1.00		1.00		1.00		1.00	
Special education	26	6	1.49	(0.99–2.24)	1.04	(0.69–1.58)	0.83	(0.55–1.27)	0.79	(0.52–1.21)
Aggravated violent crime										
General education	137	3	1.00		1.00		1.00		1.00	
Special education	31	7	**2.76**	(1.87–4.08)	**1.89**	(1.26–2.82)	1.38	(0.91–2.07)	1.29	(0.86–1.96)
Sexual offences										
General education	142	3	1.00		1.00		1.00		1.00	
Special education	50	12	**4.28**	(3.10–5.91)	**2.99**	(2.14–4.18)	**1.98**	(1.40–2.79)	**1.91**	(1.35–2.70)

Table 4 Number of offenders, crime rate, and adjusted hazard ratios (HR) and their 95% confidence intervals (CI)[a] for all offences and selected types of offences in ages 16–18 by special education background in basic education among girls[b] and boys[c] (Study design 2).

[a] Groups that differ statistically significantly from the reference group are shown in bold.

[b] Girls: general education N = 181,709, special education partly individualised N = 5,588, special education mainly individualised N = 3,368.

[c] Boys: general education N = 182,121, special education partly individualised N = 8,770, special education mainly individualised N = 6,244.

[d] Model 1: year of birth.

[e] Model 2a: Model 1 + family and parental background.

[f] Model 2b: Model 1 + continuation in upper secondary education.

[g] Model 3: Model 2 + family and parental background + upper secondary education.

[h] Includes both partly and mainly individualised special education.

A similar pattern was observed among boys: the highest levels of criminality were found among those who had been in special education only in VET. However, all other groups with a special education history also had higher criminality compared to those who had always been in general education. The differences between groups were more pronounced for offences against property than for driving under the influence. Adjusting for family and parental background explained these differences only to a limited extent, particularly among those who had participated in special education only in basic education.

GIRLS	OFFENDERS		MODEL 1[d]		MODEL 2[e]		MODEL 3[f]	
	N	CRIME RATE	HR	95% CI	HR	95% CI	HR	95% CI
All offences								
General education in both basic education and upper secondary VET	213	16	1.00		1.00		1.00	
Special education only in basic education	6	19	1.16	(0.52–2.61)	1.10	(0.49–2.49)	1.06	(0.47–2.40)
Special education only in upper secondary VET	80	48	**2.99**	(2.31–3.87)	**2.75**	(2.12–3.57)	**2.65**	(2.04–3.43)
Special education in both	20	28	**1.76**	(1.11–2.78)	1.55	(0.98–2.46)	1.46	(0.92–2.32)
BOYS								
All offences								
General education in both basic education and upper secondary VET	1,515	78	1.00		1.00		1.00	
Special education only in basic education	95	167	**2.14**	(1.74–2.63)	**2.08**	(1.69–2.56)	**2.04**	(1.66–2.51)
Special education only in upper secondary VET	649	266	**3.46**	(3.15–3.79)	**3.20**	(2.91–3.51)	**3.10**	(2.83–3.40)
Special education in both	253	193	**2.51**	(2.20–2.87)	**2.30**	(2.01–2.63)	**2.24**	(1.96–2.56)
Offences against property								
General education in both basic education and upper secondary VET	419	22	1.00		1.00		1.00	
Special education only in basic education	23	41	**1.87**	(1.23–2.85)	**1.92**	(1.26–2.93)	**1.90**	(1.24–2.89)
Special education only in upper secondary VET	200	82	**3.84**	(3.24–4.54)	**3.42**	(2.88–4.05)	**3.33**	(2.81–3.95)
Special education in basic education and upper secondary VET	94	72	**3.36**	(2.69–4.20)	**3.08**	(2.46–3.86)	**3.02**	(2.41–3.79)
Driving under the influence								
General education in both basic education and upper secondary VET	657	34	1.00		1.00		1.00	
Special education only in basic education	42	74	**2.18**	(1.59–2.97)	**2.00**	(1.46–2.74)	**1.98**	(1.45–2.71)
Special education only in upper secondary VET	233	96	**2.89**	(2.49–3.36)	**2.74**	(2.36–3.19)	**2.68**	(2.31–3.12)
Special education in both	88	67	**2.04**	(1.63–2.55)	**1.84**	(1.47–2.30)	**1.81**	(1.44–2.26)

Table 5 Number of offenders, crime rate, and adjusted hazard ratios (HR) and their 95% confidence intervals (CI)[a] for all offences and selected types of offences in ages 16–18 by special education background among girls[b] and boys[c] in upper secondary vocational education and training (VET) (Study design 3).

[a] Groups that differ statistically significantly from the reference group are shown in bold.

[b] Girls: general education in basic education and upper secondary VET N = 47,103, special education only in basic education N = 1,124, special education only in upper secondary VET N = 5,986, special education in basic education and upper secondary VET N = 2,550.

[c] Boys: general education in basic education and upper secondary VET N = 69,441, special education only in basic education N = 2,043, special education only in upper secondary VET N = 8,904, special education in basic education and upper secondary VET N = 4,754.

[d] Model 1: year of birth.

[e] Model 2: Model 1 + family background.

[f] Model 3: Model 2 + parental background.

DOI: 10.16993/sjdr.1406

DISCUSSION

MAIN RESULTS

Our findings showed higher serious criminality among those who had received special education in basic education. Family and parental background explained the differences only partly, pointing to broader structural inequalities underlying both educational trajectories and criminal outcomes. Continuation to upper secondary education accounted for the difference for girls but not for boys. In VET, criminality was highest among those who received special education only at that level.

INTERPRETATIONS

Overall, our findings can be interpreted through a disability studies perspective that locates disadvantage not in impairment itself but in the interaction between support needs, educational categorisation, and institutional responses (Thorneycroft and Asquith 2021). Rather than suggesting a direct relationship between disability and criminality, the findings point to processes of cumulative disadvantage operating across educational pathways (also Baldry et al. 2018). The association between a special education background and serious criminality may reflect accumulated disadvantage shaped by family and parental background, educational pathways, and institutional processes.

Two findings are particularly noteworthy. First, students in special education often came from disadvantaged family and parental backgrounds. However, family and parental background explained the observed differences only partly. Second, criminality was highest among those who received special education only in VET. Together, these findings suggest that later outcomes may be shaped not only by individual characteristics or family disadvantage but also by how support needs are identified and responded to within educational institutions (Baldry et al. 2018; Niemi and Mietola 2023; Thorneycroft and Asquith 2021), particularly during educational transitions. The particularly high levels of criminality among those receiving special education only in VET may indicate that support needs were recognised relatively late or that continuity of support was insufficient during earlier educational stages.

As discussed above, in addition to individual factors, social and institutional processes such as stigma, peer isolation, and bullying may further contribute to criminalisation and help explain the patterns observed in this study. Labelling youth as 'at risk' can initiate cumulative stigmatisation, fostering social exclusion and outsider identities, factors linked to increased levels of criminal behaviour (Deakin, Fox and Matos 2022). Peer influences are also crucial (Posey, Timmer and Ramirez 2024), and students in special education are disproportionately affected by bullying as both victims and perpetrators (Rose et al. 2011), with the latter associated with increased criminal involvement (Ttofi et al. 2011).

Only a small proportion of young people committed serious crimes. Higher levels of criminal behaviour were observed among those who had dropped out of comprehensive school and those who did not continue to upper secondary education. Being excluded from education during adolescence may be linked to increased criminal behaviour (Cornish and Brennan 2025) and difficulties in educational attainment. These patterns are consistent with a life course perspective in which cumulative educational exclusion increases vulnerability to later criminalisation and further marginalisation. Criminal behaviour was less common among students who had received special education than among those who had dropped out, but more common than among those in general education.

Both special education and criminality were less common among girls than among boys. However, the relative difference in serious crime between those in special and general education was similar for girls and boys. This suggests that the association between a special education background and later serious criminality follows a broadly similar pattern across genders. Previous research has shown that while severe adverse outcomes such as incarceration are less common among women, gender differences tend to narrow among individuals with prior justice involvement (Kaskela and Pitkänen 2018).

Students in special education were less likely to make a direct transition to upper secondary education than their peers. Among those who did not transition immediately, serious

DOI: 10.16993/sjdr.1406

criminality was more common. These findings underscore the role of educational transitions as points where institutional support may either reduce or reinforce existing inequalities within the education system. The results suggest that the ways in which support needs are recognised, categorised, and addressed within educational institutions may shape later educational opportunities and life trajectories (Menze, Solga and Pollak 2023). Educational transitions may therefore represent critical points at which inequalities are either reproduced or mitigated, as transition periods have been linked to increased dropout risk among students with disabilities (Foreman-Murray, Krowka and Majeika 2022). However, many continue their studies later, and only a few remain without upper secondary education (Ringbom et al. 2024). Family and parental background factors, as well as continuation to upper secondary education, accounted for more of the variation in criminal outcomes among girls than boys, possibly reflecting stronger selection into special education among girls.

Our findings suggest that special education may have a protective role when provided in time and aligned with students' needs. However, higher criminality among those who received special education only VET points to possible gaps in earlier identification or continuity of support. This group may include young people whose support needs were recognised relatively late, or whose educational difficulties increased during adolescence. The reasons for receiving special education at this stage may also differ from those in basic education, for example through substance use affecting studies. Early onset of substance use is linked to subsequent criminal behaviour and low educational attainment (Pitkänen 2006).

The largest differences between special education and general education across offence types were observed in offences against property and, among boys, in sexual offences, whereas the differences in narcotic offences were smaller. The results of a Finnish study (Kivivuori and Salmi 2009) report similar patterns. The observed variation across offence types points to the importance of contextual and social factors, as special educational needs alone cannot explain why differences were larger for some offences than for others. Processes of labelling, stigma, and cumulative disadvantage may contribute to these unequal outcomes by influencing educational experiences, social participation, and later life opportunities (Hollomotz 2013).

Students who receive special educational support constitute a highly diverse group. Beyond providing support for learning needs, special education involves processes of educational categorisation and institutional labelling that shape expectations, educational pathways and later life opportunities (Hollomotz 2013; Menze, Solga and Pollak, 2023; Niemi and Mietola 2023). Learning difficulties, ADHD, and language difficulties are linked to juvenile criminality (Mallett et al. 2023; Pyle et al. 2016) and are prevalent among adult prisoners (Morken, Jones and Helland, 2021; Tuominen et al. 2014), often alongside behavioural disorders (Aro et al. 2022). The timing of the identification of support needs may further shape educational trajectories. For instance, diagnoses during early adolescence are linked to increased dropout risk (Ringbom et al. 2024).

STRENGTHS AND LIMITATIONS

A major strength of this study was the use of individual-level register data covering the total population, which enhances the generalisability and reliability of the findings. The data included information on special education, criminality, and several background factors. However, information on the reasons for receiving special education was unavailable, and data on special education were missing for those who did not apply to secondary education or who had dropped out from basic education. Moreover, only recorded criminality was captured; serious offences are likely to be registered, whereas drug-related crimes may be underreported (Babinski, Hartsough and Lambert 2001).

POLICY IMPLICATIONS

The results highlight the broad vulnerability of young offenders and the need for sustained support for students with special educational needs. Previous research has shown that individuals with a special education background, particularly those without an upper secondary qualification, face difficulties in securing stable employment (Menze, Solga and Pollak 2023). Although early support for academic, behavioural, and emotional difficulties is important (Aro et al. 2022), early school leaving and delayed transition to upper secondary education indicate that support during basic education is not always sufficient (Knight et al. 2025). This underlines

the importance of high-quality, well-coordinated educational, health, and welfare services. Strengthening inclusive education in line with the UN Convention on the Rights of Persons with Disabilities (United Nations 2006) and ensuring timely support across services may help reduce later disadvantage.

Future research should re-examine the transition to upper secondary education in the context of Finland's extended compulsory schooling. Since the study period, the school leaving age has been raised from 16 to 18 (Act on Compulsory Education 1214/2020), while vocational education has faced resource reductions and increased independent study requirements, potentially affecting access to support. Evidence from the United States suggests that extending compulsory education may reduce youth crime by limiting opportunities for offending (Anderson 2014). Together, these changes highlight the importance of addressing both individual support needs and structural features of the education system to prevent unequal pathways.

CONCLUSION

Our study adds to the understanding of the complex relationship between special education and serious crime in the Nordic context. Overall, the findings are in line with broader discussions on how educational systems can both mitigate and reproduce social inequalities. While some students in special education show high levels of criminality, most do not engage in criminal behaviour. The findings indicate the importance of early support: well-designed, well-implemented, and appropriately timed special education may act as a protective factor rather than a risk. The relationship between special education and criminality is influenced by family and parental background, as well as by later continuation to upper secondary education. Our findings support a disability studies perspective by suggesting that later differences in criminality cannot be understood solely in terms of individual impairments or support needs. Rather, they point to the importance of the institutional structures and social environments in which young people are identified, supported, and educated. Schools and special education constitute key institutional contexts through which opportunities, expectations, and life trajectories are shaped. As the relationship between participation in special education and later criminality appears to be complex and multifaceted, further research is warranted. Future studies should pay particular attention to the experiences and perspectives of students who have received special education, as their voices are critical for understanding the mechanisms and developmental pathways that may underlie these associations.

DATA ACCESSIBILITY STATEMENT

Due to legal restrictions and data protection regulations of the administrative sources providing individual-level register data, the authors do not have the permission to make sensitive personal data available. Concerning data of the Social Insurance Institution of Finland, interested parties may apply for permissions to access the data from the centralised data permit authority Findata (https://www.findata.fi/en/). Concerning data on socioeconomic background, permissions may be applied from Statistics Finland (https://stat.fi/en/services/services-for-researchers). The reproducible Stata code is available on request from the corresponding author.

FUNDING INFORMATION

This work was supported by The Ministry of Social Affairs and Health under grant number VN/10950/2024.

COMPETING INTERESTS

The authors have no competing interests to declare.

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TO CITE THIS ARTICLE:
Rinne, Hanna, Teemu Kaskela, Johanna Korkeamäki, Annika Hokkanen, and Tuuli Pitkänen. 2026. "Special Education and the Risk of Committing Serious Crime in Finland." *Scandinavian Journal of Disability Research* 28(1):622–637.DOI:https://doi.org/10.16993/sjdr.1406

Submitted: 20 November 2025
Accepted: 18 October 2026
Published: 02 November 2026

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