

REGULAR ARTICLE

# Chronic conditions in children increase the risk for physical abuse – but vary with socio-economic circumstances

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**ABSTRACT**

**Aim:** To explore whether children (age 10, 12 and 15 years) with self-reported chronic conditions are at higher risk of physical abuse and/or exposure to intimate-partner violence than other children, while considering the importance of demographic factors.

**Methods:** A national cross-sectional study of 2771 pupils in grades 4, 6 and 9 from 44 schools in Sweden (91% response rate). Conflict Tactic Scales were used to measure physical abuse and separate questions measured exposure to intimate-partner violence. A list of 13 diagnoses was used to estimate chronic conditions.

**Results:** Children with chronic conditions had an increased risk for physical abuse (CPA) only (OR 1.67) as well as in combination with exposure to intimate-partner violence (IPV) (OR 2.54), but not to IPV only, compared to children without chronic conditions. Furthermore, when chronic conditions were combined with country of birth other than Sweden and living in low-income areas, the risk for CPA increased even more, indicating interactive effects.

**Conclusions:** A wide range of chronic health conditions in children increased the risk for physical abuse. This indicates that certain factors unite this group of children, irrespective of the type of disability or degree of severity, but where a combination with socio-economic circumstances is of importance.

**INTRODUCTION**

Three recent research reviews on children's vulnerability to abuse are essentially unanimous – children with disabilities are at greater risk of experiencing all types of abuse than children without disabilities (1–3). Depending on study design and sample, the rate of neglect, physical abuse and sexual abuse has been estimated to be 1.7–7 times higher for children with disabilities compared to children without disabilities. The largest population-based study on this issue conducted in USA (4) found that children with disabilities were 3.8 times more likely to be neglected, 3.8 times more likely to be physically abused and 3.1 times more likely to be sexually abused.

The pattern of vulnerability to abuse among children with disabilities varies. Some studies show that children with mild or less obvious disabilities are at greater risk than children with more severe disabilities (5,6). Other studies show that more abuse occurs in certain disabilities, where children with behavioural/mental health problems seem to be particularly vulnerable (4,7,8). Knowledge of the links between demographic factors and abuse among children

with disabilities is limited. Some studies have shown that boys with disabilities are more likely to report physical abuse and neglect than girls (9), while other studies show no differences between the sexes (7).

To increase the knowledge of the specific vulnerability among children with disabilities and chronic conditions, researchers have underlined the importance of using different data collection methods to obtain a more valid measure of the prevalence and risk factors (10). A commonly used approach in collecting data on abuse among children with disabilities or chronic diseases is to review reports of child abuse to state agencies such as Child Protection Services (CPS) or whole population databases from multiple reporting agencies (4,5,7,11). These methods make it possible to examine a great number of cases, which is a methodological strength. However, the use of different reports of child abuse most likely implies an underestimation of the prevalence of abuse, as indicated by several other studies (12–14).

There has also been a requirement that disability status should be added to all studies of child maltreatment, including national incidence studies, to give a more accurate indication of disabled children's vulnerability (4,15). This would accordingly increase the knowledge of the importance of a combination of health condition and demographic risk factors for vulnerability to violence, which results from a recently published Swedish study also indicate (16). In line

**Abbreviations**

CPA, Child physical abuse; IPV, Intimate-partner violence.

with previous studies, the authors conclude that child physical abuse is associated with several risk factors and is linked to combinations of risk factors at different levels. The crude analyses showed an increased risk of physical abuse for children who had reported any type of disability (OR 2.6–4.2). However, the odds ratio decreased (OR 1.0–1.9) when the results were adjusted for factors such as parents' employment, child's social network and immigrant status.

To reveal specific patterns of risk for children with disabilities and chronic health conditions, more studies are needed. It is also well known that there is an overlap between child physical abuse and exposure to intimate-partner violence (17,18); however, no assessment has been made of whether children with disabilities also are at greater risk of witnessing intimate-partner violence and if so, in what settings. The current study will explore this issue.

### Aim

The aim of current study is to explore whether children (age 10, 12 and 15 years) with self-reported chronic conditions are at a higher risk of physical abuse and/or exposure to intimate-partner violence than other children, also taking into account the importance of demographic factors such as sex, living conditions, country of birth and economic status of the area where the family is living.

## METHOD

### Data collection

A questionnaire study was carried out between November 2006 and February 2007. Statistics Sweden (SCB) were responsible for collecting the data. No incentives were provided to the schools or to the pupils. The study was approved by the regional research ethical committee in Uppsala 2006.

### Selection of schools and classes

The National Geographical Information System (GIS) was matched to the national school register (both systems were up-to-date) to create a GIS-map around every single school in Sweden ( $n = 931$ ). The catchment area for each school was within a radius of 2–3 km, which corresponds to a normal catchment area for Swedish secondary schools. The national population registers from SCB of disposal income, country of birth and education level were then used to identify all households within every area. As economic differences at the aggregated level are very small in Sweden, the selection of schools was made to enable comparisons between very poor areas (low-income areas), average areas (middle-income areas) and rich areas (high-income areas):

- Low-income areas: average income level between 162 612–189 649 SEK/year represented by the 14 schools with the lowest income areas of all 931 schools.
- Middle-income areas: average income level between 191 196–286 098 SEK/year, represented by 15 randomly selected schools within this interval.

- High-income areas: average income level of 315 347–455 014 SEK/year represented by the 15 schools with the highest income areas of all schools.

An information letter was sent from SCB to the headteacher at each of the 44 schools, who then approved the study. The headteachers consulted the teachers and decided which class in each grade (4, 6 and 9), that for practical reasons, had the possibility to participate. When the most suitable time for the study was decided, an information letter was sent to the pupils' homes for consent. The parents were informed of the aim of the study and they were also informed that participation was voluntary and anonymous. On data-collection day, an interviewer from SCB visited each class. In total, 45 min were reserved for the study. The interviewer informed the pupils about the aim of the study and that participation was voluntary and anonymous. The interviewer also remained in the classroom while the pupils answered the questionnaire, but the teachers were not allowed to attend. After the survey was completed, the interviewer collected the questionnaires.

### Study population

The population consisted of 2771 pupils in grades 4, 6 and 9 (corresponding to ages 10, 12 and 15 years), from the 44 selected schools. Of the 2771 pupils, 2510 answered the questionnaire, corresponding to a response rate of 91%. Almost all the pupils who did not answer the questionnaire were absent from school on the day for the survey. The reasons for this are unclear except for two children, whose parents did not allow them to participate. Two other children became nervous when answering the questionnaire and did not manage to complete it.

The internal dropouts for important key questions were in general low: physical abuse (5%), intimate-partner violence (2%) and chronic conditions (5%). A comparison between income areas showed no differences according to sex and age. However, the percentage of children born in foreign countries was significantly higher in low-income areas (18%) than in middle-income areas (12%) or high-income areas (4%) (linear by linear  $p < 0.001$ ). In high-income areas, more children lived with both biological parents (81%) compared with children in middle (75%) and low-income areas (68%) (linear by linear  $p < 0.001$ ).

### Measures

#### Physical abuse and exposure to intimate-partner violence

Questions based on Conflict Tactic Scales (19) were used to measure mild and severe physical abuse (CPA). The children were asked if they ever had their ears boxed, were severely shaken, had their hair pulled (mild physical abuse), were beaten severely by hand or were beaten with a device (severe physical abuse). Two questions measured intimate-partner violence (IPV) and were phrased as follows: Has it ever happened that the adults in your family have hit each other? Did you witness the violence between the adults in your family? The response alternatives for both questions were, 'No', 'Yes, once or twice', 'Yes, several times'. In this

study, we only consider whether the children ever had experienced domestic violence (yes/no).

### Chronic conditions

By chronic condition, we mean a chronic disease/disorder and/or long-term disability. To estimate the prevalence of chronic conditions, a list of 13 diagnoses was used based on previous Nordic studies (19). The diagnoses are visual impairment, hearing impairment, speech defect, diabetes, mental illness, epilepsy, stomach pain, asthma, allergic rhinitis, eczema, physical dysfunction, overweight and ADHD/ADD. The question asked was whether the children had had any defined chronic disease or disability with duration of at least 3 months within the last year. No further questions were used to identify how severe the condition was or in what way it affected the children's daily life.

### Analysis

To assess the importance of chronic conditions and demographic factors for CPA and IPV, we used univariate tests (Chi-square) and multiple logistic regression analyses as well as stratified analyses to avoid confounding problems. Associations were expressed as crude odds ratio (OR) and adjusted odds ratio (AOR) with a 95% confidence interval. Trends in the experience of CPA and IPV in relation to chronic conditions were tested by linear-by-linear association. All analyses were considered to be statistically significant when the p-value was <0.05. Statistical analyses were carried out using SPSS for Windows (version 18.0).

## RESULTS

Of the total sample of 2510 children, 302 children (12%) reported that they had been physically abused (CPA) during their childhood and 174 children reported exposure to intimate-partner violence (IPV) (7%). Of the physically abused children, 25% also reported exposure to IPV, giving 73 children both abused and exposed to IPV (3%). Among the children reporting only physical abuse, fifteen per cent had been severely abused compared to thirty per cent among children reporting both physical abuse and IPV.

In total, 633 children (25%) reported one chronic condition, 254 children (10%) reported two chronic conditions and 106 children (4%) reported three conditions or more. Children in 9th grade reported significantly more chronic conditions than children in the 4th and 6th grade. Children from low-income areas, children who did not stay with both their parents and girls were overrepresented among children with chronic conditions in 9th grade. Among children in the 4th and 6th grades, there were no differences in reported chronic conditions according to sex, living conditions, country of birth or income level (data not shown).

Univariate tests (Chi-square) were carried out to show the association between specific health conditions and CPA as well as IPV. As can be seen in Table 1, the prevalence of both CPA and the combination of CPA and IPV were significantly higher for children with chronic conditions compared to children with no chronic conditions. The increased

**Table 1** Prevalence of physical abuse (CPA), intimate-partner violence (IPV) and a combination of CPA and IPV among children with and without chronic conditions

Health condition	N	CPA only		IPV only		CPA + IPV	
		n	%	n	%	n	%
No chronic condition	1389	98	7.4 (ref)	45	3.3(ref)	22	1.6 (ref)
Chronic condition	993	113	11.8***	44	4.5	48	4.9***
One chronic condition	633	63	10.4*	25	4.0	22	3.5**
Two chronic conditions	254	34	13.7***	16	6.2*	13	5.1***
Three or more chronic cond.	106	16	15.8**	3	2.8	13	12.3***
Visual imp.	186	20	10.8***	11	5.8*	11	5.9***
Hearing imp.	75	11	14.5**	6	7.8*	8	10.3***
Speech defect	33	6	18.2**	2	5.9	5	14.3*
Diabetes	18	1	5.6	0	0.0	2	11.1**
Mental illness	70	11	15.5**	3	4.2	14	19.7***
Epilepsy	12	1	8.3	1	7.7	3	23.1***
Stomach pain	243	33	13.5***	10	4.0	19	7.6***
Asthma	197	20	10.2	10	5.0	9	4.5***
Allergic rhinitis	288	30	10.4*	10	3.3	12	4.0***
Eczema	220	27	12.3**	8	3.5	15	6.5***
Phys. dysfunc.	14	3	21.4*	1	7.1	3	21.4***
Overweight	93	15	16.1***	4	4.1	13	13.1***
ADHD	22	5	23.8**	0	0.0	6	27.3***

Chi-square tests against index-group = No chronic condition.

\*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001.

risk was present for almost all kinds of chronic conditions. Trend analysis showed that the reported prevalence of CPA, no matter how severe, as well as the reported prevalence of CPA combined with IPV increased by the number of reported chronic conditions, where children with three or more chronic conditions turned out to be the most vulnerable group (linear by linear association p < 0.001).

### Risk analysis (OR)

Table 2 shows the risk (OR) of different combinations of CPA and IPV by demographic variables and chronic health condition. In summary, most of the known risk factors that were asked for in the survey had an association with 'CPA only', as well as in combination with IPV, while the risk factors for 'IPV only' were few. Children born outside Sweden were at an increased risk for CPA compared to children born in Sweden, while the association between low-income area and CPA was on the borderline for significance in the adjusted analyse. It was shown that children with chronic conditions reported more CPA as well as both CPA and IPV compared to children without chronic conditions, while their risk of IPV only was not statistically different from children without chronic conditions. In general, demographic factors as well as health conditions were found to have the strongest association with CPA in combination with IPV.

Stratified analyses showed that the reported prevalence of CPA (CPA only and the combination of CPA and IPV) was significantly higher on an equal level for children with chronic conditions than for children without chronic

**Table 2** Associations between demographic factors as well as health conditions and four different measures of abuse and violence

Total population (n = 2510)	%	CPA (CPA only or CPA in combination with IPV) (n = 302)		Only CPA (n = 223)		Only IPV (n = 93)		Both CPA and IPV (n = 73)	
		OR (adj.) <sup>†</sup>	95% CI	OR (adj.) <sup>†</sup>	95% CI	OR (adj.) <sup>†</sup>	95% CI	OR (adj.) <sup>†</sup>	95% CI
Grade									
4th–6th	66	1.00		1.00		1.00		1.00	
9th	34	<b>1.77***</b>	1.37–2.29	<b>1.37*</b>	1.02–1.83	<b>1.72*</b>	1.12–2.66	<b>2.92***</b>	1.59–4.45
Gender									
Female	50	1.00		1.00		1.00		1.00	
Male	50	<b>1.30*</b>	1.00–1.68	<b>1.49*</b>	1.11–2.00	1.14	0.74–1.76	0.83	0.51–1.37
Country of birth									
Sweden	89	1.00		1.00		1.00		1.00	
Outside Sweden	11	<b>2.13***</b>	1.51–3.01	<b>1.89**</b>	1.25–2.73	1.01	0.51–1.99	<b>2.28*</b>	1.23–4.22
Family situation									
Living both biol. parents	74	1.00		1.00		1.00		1.00	
Not living both biol. parent	26	<b>1.90***</b>	1.45–2.49	1.29	0.94–1.77	<b>2.61***</b>	1.69–4.05	<b>4.14***</b>	2.51–6.83
Income area									
Middle-high	63	1.00		1.00		1.00		1.00	
Low	37	1.22	0.94–1.59	1.16	0.86–1.57	0.80	0.51–1.27	1.23	0.75–2.03
Health condition									
No disability	61	1.00		1.00		1.00		1.00	
Disability	39	<b>1.88***</b>	1.45–2.45	<b>1.67***</b>	1.24–2.24	1.20	0.78–1.86	<b>2.54***</b>	1.50–4.32

Note: Association expressed as adjusted ORs and 95% CI.

CPA = Child physical abuse; IPV = Intimate-partner violence.

Bold value are significant as follows: \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001.

<sup>†</sup>Adjustments made for all factors in the table.

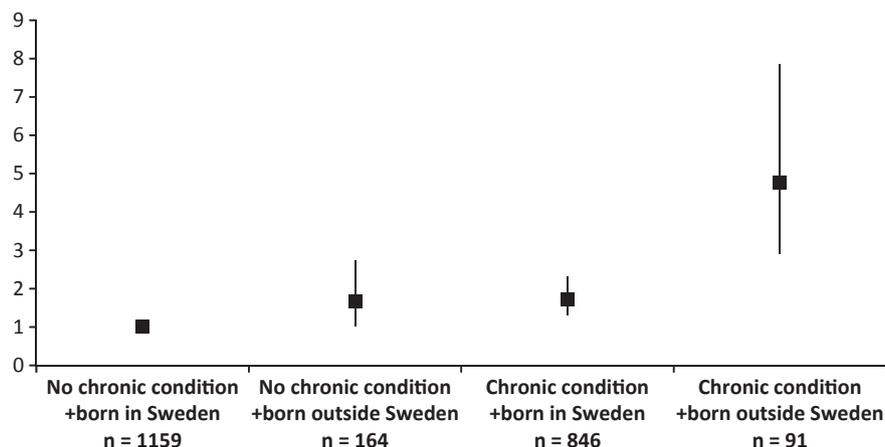
condition, irrespective of age, sex and family situation. However, the risk was higher for children born outside Sweden than for children born in Sweden (Adj. OR 2.57 vs. 1.67) and the risk was also higher for children from low-income areas than for children from middle-high-income areas (Adj. OR 2.08 vs. 1.69).

Further analyses were conducted to control the impact of a possible interaction between health conditions and country of birth and income area. As shown in Figure 1, the highest risk for CPA was found among children with chronic conditions in combination with being born outside of Sweden. In fact, the risk for CPA was significantly higher

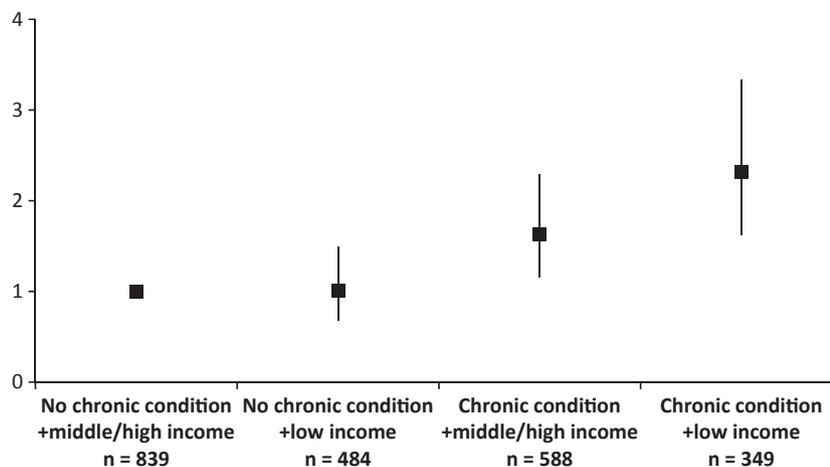
in the group of chronic diseased children born outside of Sweden when compared with chronic diseased children born in Sweden (Adj. OR 2.7, 95% CI; 1.7–4.3). Furthermore, when combining chronic conditions with being living in low-income areas, a similar interactive effect was indicated (Adj. OR 1.6, 95% CI; 1.1–2.3) (Fig. 2).

## DISCUSSION

The current study showed that twelve per cent of all children had been physically abused (CPA) and seven per cent had been exposed to intimate-partner violence (IPV).



**Figure 1** Combined effect of chronic conditions and country of birth on the risk for child physical abuse (CPA) when compared with referents expressed as adjusted odds ratios with 95% CI.



**Figure 2** Combined effect of chronic conditions and income area on the risk for child physical abuse (CPA) when compared with referents expressed as adjusted odds ratios with 95% CI.

Overall, children with chronic health conditions turned out to be at an increased risk of CPA. The results are in line with a recently published Swedish study from Sörmland County (16). The risk for abuse (only or in combination with IPV) increased with the number of chronic conditions, where children with more than two reported chronic conditions turned out to be the most vulnerable group. Contrary to this, we found that children with chronic conditions in general were not at an increased risk of IPV only, compared to children without chronic conditions. Our findings indicate that children with chronic conditions are particularly vulnerable to abusive reactions directed towards them but not necessarily to IPV. It has been shown in previous studies (20–22) that the child's chronic health condition places major demands on the family. This might first and foremost trigger for an abusive reaction towards the child, while IPV to some extent can be explained by other factors, such as marital conflict or male control of wealth and decision-making (23). The particular vulnerability to CPA could also be linked to the discipline-mediated model of physical abuse, which suggests that some abusive disciplinary actions can be conceptualized as normative behaviour that has escalated to an injurious level because of parental irritability and stress elicited by the child's coerciveness (24).

At the same time, it is important to notice that our cross-sectional results do not explain if the chronic health conditions predispose the children to be at increased risk for CPA or if the chronic condition is an effect of victimization. Health conditions as, i.e. long-term stomach pain, asthma and eczema, may in part be of psycho-somatic nature linked to psycho-social stress and could also appear in combination with other chronic conditions. To establish new knowledge of the relationship between chronic health conditions, psycho-somatic symptoms and experience of abuse, longitudinal studies should be conducted.

Other important result in our study is the indication of interactive effects between chronic condition, born outside Sweden and living in low-income areas. The highest risk for CPA was found among children with chronic conditions

born outside of Sweden. Data on demographic and socio-economic factors are available in several studies on this issue but they are seldom used for further analysis. Sullivan and Knutson (4,11) point to the link between maltreatment and economic disadvantage but do not estimate the risk of abuse in relation to the combination between disability and socio-economic status. Jaudes et al. (7) concluded that disabled children in low-income areas were at increased risk of abuse and neglect compared to nondisabled children in the same area, which supports our findings. However, that study is limited as it could not be applied to a general population. With a different methodological approach, our findings expand those of previous research on this issue. We show that chronic health conditions in children do increase the risk for physical abuse, but vary with socio-economic circumstances. Our results underline the importance of considering both health status and socio-economic background in all studies of child maltreatment.

Although the pattern of vulnerability among children with disabilities is not without variation, we have shown that a wide range of disabilities and common long-term health complications can be crucial. We may therefore presume that there are certain factors that unite this group of children irrespective of the type of disability or degree of severity, where the combination with certain demographic characteristics is probably of importance. From a preventive perspective, this raises several questions regarding supposed differences in help-seeking behaviours and parental knowledge of the support available. To increase the knowledge of the mechanisms that trigger violence against this group of children, it is important to not only focus on the abusive situation but to understand how the families handle their life situation in relation to available professional support. This is currently followed up by our research group by in-depth interviews.

#### Limitations

As there is no clear definition of chronic conditions, it was a challenge to find an adequate means of measuring this in a

way that was easy for children to understand. To measure chronic conditions, we decided to use a list of diagnoses that had been used earlier in Nordic studies (19). When analysing the results, we found some weaknesses in the list regarding questions of visual impairment and stomach pain. These two diagnoses should have been further specified. The list is also limited by its characterization of chronic conditions as it does not provide additional insight into, for instance, duration longer than 3 months or its severity. Another difficulty is, of course, the risk of recall bias, particularly for reports of physical abuse and/or domestic violence. A limitation is that children of different ages respond differently about the incidences of corporal punishment. This could probably be important for certain analyses, but had no impact on the results published in this paper.

The study is also limited as it does not include several confounding variables such as parents' SES, education level and employment status. Without individual information regarding the family's socio-economic level, aggregated data from school catchment areas were used to define income level. To examine differences, schools from the very lowest and highest income areas were selected. Even if this is not the most perfect proxy, it is interesting to see that in a comparatively equal country like Sweden, with free access to education, health care and social services, and where physical abuse has decreased extensively during the last forty years (25), differences resulting from an interaction between income level, country of birth and chronic health conditions can be shown.

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