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Childhood Sexual Abuse, Intellectual Disability and Health Disorders: A Matched Cohort Study

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Abstract:	This study assesses whether children with intellectual disabilities (ID) are more at risk of sexual abuse and whether they have similar consultation rates for physical and mental health disorders than children without ID. The matched-cohort design study uses administrative databases of children who had a sexual abuse report corroborated by a child protection agency and a matched group from the general population. Children with ID were 3.5 times more likely to have a corroborated sexual abuse report when compared to their peers without ID and a higher post-abuse number of medical consultations for physical and mental health disorders. Children with ID are more at risk of sexual abuse and physical and mental health disorders and may also be more vulnerable to the effects of abuse.

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Abstract

This study assesses whether children with intellectual disabilities (ID) are more at risk of sexual abuse and whether they have similar consultation rates for physical and mental health disorders than children without ID. The matched-cohort design study uses administrative databases of children who had a sexual abuse report corroborated by a child protection agency and a matched group from the general population. Children with ID were 3.5 times more likely to have a corroborated sexual abuse report when compared to their peers without ID and a higher post-abuse number of medical consultations for physical and mental health disorders. Children with ID are more at risk of sexual abuse and physical and mental health disorders and may also be more vulnerable to the effects of abuse.

Keywords: Intellectual Disability, Childhood Sexual Abuse, Risk, Physical and Mental Health Disorders

Short title: Intellectual disability and childhood sexual abuse

Childhood Sexual Abuse, Intellectual Disability and Subsequent Physical and Mental Health Disorders: A Matched Cohort Study

The increased risk of abuse of children with intellectual disabilities (ID) has been a theme of international scientific research for the last 30 years (Akbaş et al., 2009; Sullivan & Knutson, 2000; Wissink et al., 2015). In addition to having an increased risk of presenting mental and physical health problems than the general population (Buckley et al., 2020; Liao et al., 2021), children with neurodevelopmental disorders such as ID are 2 to 7 times more likely to be maltreated than children without ID (Sullivan & Knutson, 2000) and more at risk of experiencing various forms of victimization as young adults (Berg, 2015). For child protection-involved children, sexual victimization and exploitation risk increases as intellectual abilities decrease (Carrellas et al., 2021).

Children with ID are also at a higher risk, up to 4.6 times, for some forms of abuse, including sexual assault, than children with other disabilities (Jones et al., 2012). As a result, children with ID are overrepresented in child welfare services: they account for up to 15% of maltreated children in Canada (Hélie et al., 2017), while the overall prevalence of ID in the general population is 1.4% (Maulik et al., 2011). Being female and from lower socioeconomic settings are also associated with an increased likelihood of being exposed to childhood sexual abuse (Collin-Vezina et al., 2013; Mathews et al., 2017; Stoltenborgh et al., 2011) and should be considered when assessing the risk of CSA associated with ID.

Negative short- and long-term consequences have been associated with childhood maltreatment, specifically with childhood sexual abuse, including a wide range of physical and mental health disorders (Hillberg et al., 2011; Irish et al., 2010)*[citations blinded for review]*. Although some report that all forms of childhood maltreatment incur similar psychiatric and

behavioral consequences (Vachon et al., 2015), others find that sexual abuse is more detrimental than all other forms of victimization (Finkelhor et al., 2009). Children with ID are considered more vulnerable, especially in developmental terms (Fisher et al., 2008; Lightfoot, 2014; Stalker & McArthur, 2012). However, very few studies have been conducted on the associated factors and the consequences of childhood sexual abuse with populations of children with ID (Paquette et al., 2018). Sex differences in the consequences associated with childhood sexual abuse indicate that we should consider this effect in future studies (Daigneault et al., 2017; Wekerle & Black, 2017; Wekerle et al., 2017).

Through meta-analyses and literature reviews, the scientific literature has been repeating itself for more than 20 years: child abuse rates are much higher for those with disabilities (Byrne, 2018; Horner-Johnson & Drum, 2006; Sullivan & Knutson, 2000; Wissink et al., 2015). This is specifically true for intellectually disabled children in out-of-home care who are more often sexually abused (Euser et al., 2016). Some of our recent studies have gone beyond the risk issue to show that these children face more factors of social and family adversity and adaptation and health problems than other abused children *[citations blinded for review]*. Other studies have shown that children with disabilities seem to have a higher risk of clinical depression (Berg et al., 2015) and other mental health problems (Águila-Otero et al., 2018) than children without disabilities exposed to the same victimization experiences or also in residential care, highlighting a heightened vulnerability for victimized children with disabilities.

However, significant methodological limitations still hinder the development of scientific knowledge surrounding the issue of maltreatment and its detrimental consequences in the context of intellectual disability (Dion et al., 2018; Fisher et al., 2008; Jones et al., 2012; Paquette et al., 2018). Studies are conducted almost exclusively on small convenience samples or clinical

populations and are mostly retrospective, cross-sectional designs with adult populations using self-report measures for documenting maltreatment and health (Brewin et al., 1993; O'Donnell et al., 2010; Straus, 1998). Most study designs lack comparison groups of children without ID, maltreatment, or both. They do not control confounding factors, which inhibits distinguishing the effect of abuse from pre-existing mental disorders co-occurring with ID (Jones et al., 2012). Finally, most studies do not simultaneously assess the risk of sexual abuse for children with ID and their subsequent risks for health problems compared with non-abused or non-intellectually-disabled peers or assess a limited number of health problems.

The current study will use administrative medical data from a matched cohort study to test whether children with ID are overrepresented among children with a corroborated report of sexual abuse compared with a matched group from the general population. Only corroborated reports will be included because of the heterogeneity of explanations for non-corroboration, one being sufficient proof that no abuse occurred (Jenkins et al., 2017). The design and analyses will control confounding factors (sex, age, and socioeconomic level) to alleviate prior limitations. The hypothesis is that other factors being equal, children with ID will represent a higher proportion of those with a corroborated report of sexual abuse than the general population. A second study goal is to determine the contribution of both ID and sexual abuse in predicting inpatient (hospitalizations) and outpatient consultation rates for physical and mental health disorders after the abuse report (or the same date for the matched child) while controlling for sex, pre-existing disorders, and socioeconomic level. The hypothesis is that, overall, the presence of a diagnosis of ID and belonging to the group with a corroborated report of sexual abuse, in contrast to those without ID and from the general population group, will both be associated with more consultations for physical and mental health disorders following the reported sexual abuse.

Method

Study Design

This observational study used a matched-cohort design over 17 years (1996-2013). This design enables assessing the risk of a sexual abuse report related to a diagnosis of ID and the risk of consulting for physical and mental health disorders following childhood sexual abuse while controlling for disorders diagnosed before the sexual abuse report. Observational studies are the best choice and are essential for documenting causal linkages when randomized experimental studies are impractical or unethical (Black, 1996). The ethics committee of the first author's university and all participating agencies have granted a certificate of ethical compliance or authorization for obtaining confidential data in the administrative medical and child protection records and waived the necessity to obtain individual participants' consent. Data were denominated and encrypted before being transmitted to the research team. Although none focused on ID, analyses using this same dataset have already been published focusing on varied consequences of child sexual abuse *[citations blinded for review]*.

Procedures and Participants

Children under 18 years of age who had a sexual abuse report corroborated at the participating urban *[blinded for review]* child protection agency over ten years (2001-2010) were included in the abused group (n = 955). Each participant with available medical data (n = 882 or 92%) was matched to a peer of the same birth month and year, sex at birth, administrative region of the same child protection agency, and similar drug insurance coverage (socioeconomic proxy). Matched peers were sampled from the public health insurance agency databases, covering all citizens and permanent residents. Medical data covering 17 years of outpatient and inpatient consultations (1996-2013) were then extracted and used to create the study variables described

below. The abused and matched-control groups (n = 882 each) were composed of 75% females (661 each) and 25% males (221 each). As published in a prior study *[citation blinded for review]*, children were, on average, 11 years and one month at the time of their entry into the study, i.e. the day of the corroborated child sexual abuse report for each abused child, and the same day for each child's matched control. Boys were, on average, younger than girls at the time of the abuse report (10 years vs 11 years and five months) *[citation blinded for review]*.

Measures

Childhood sexual abuse. This variable has two levels: 1) the sexually abused group and 2) the matched control group from the general population. Sexual abuse was defined as any gesture of a sexual nature, with or without physical contact, committed without consent or through emotional manipulation or blackmail *[citation blinded for review]*. When sexual abuse is reported to the child protection agency, a summary analysis of the situation helps decide if the report should be screened-in for investigation. If it is, a social worker evaluates the child's situation and living conditions and makes a clinical judgment regarding the level of corroboration of the sexual abuse. Participants in the abused group were those whose sexual abuse report was corroborated, meaning there was sufficient evidence that sexual abuse had occurred (e.g. child disclosure, witness). The date of each child's corroborated sexual abuse report was also used in the following analyses to determine all pre and post-consultations for mental and physical health disorders. If a child had more than one corroborated sexual abuse report, the first one was used. Children in the general population group did not have corroborated reports of sexual abuse between 2001 and 2010 at the participating agency while residing in the same geographical area; that is how they were selected for inclusion in the matched group.

Intellectual Disability. ID was defined as at least one diagnosis for an inpatient or outpatient consultation between January 1, 1996, and March 31, 2013, from the "Mental retardation" (F70-F79) disorder category of the 10th version (2008) of the International Classification of Diseases (ICD). It is diagnosed by a medical doctor based on the ICD definition of ID (mental retardation), including all those with an IQ below 70, which is "likely to result in some learning difficulties in school. (…) marked developmental delays (…), continuous need of support, (…) or severe limitations in self-care" depending on the level of the disability (2008).

Health outcomes. All diagnoses of physical health disorders appearing in the public health insurance database for outpatient and inpatient medical consultations between January 1, 1996, and March 31, 2013, were documented and classified according to 13 major diagnostic categories of the 10th version (2008) of the ICD: 1) Infectious and parasitic diseases; 2) Neoplasms; 3) Diseases of the blood; 4) Endocrine, nutritional and metabolic diseases; 5) Diseases of the nervous system; 6) Diseases of the eye; 7) Diseases of the ear; 8) Diseases of the circulatory system; 9) Diseases of the respiratory system; 10) Diseases the digestive system; 11) Diseases of the skin; 12) Diseases the musculoskeletal system; 13) Diseases of the genitourinary system. We first created a control variable by summing all consultations for these disorders from 1996 to the date of the sexual abuse report for each child with a corroborated abuse report, using the same period for each matched-control. A dependent variable was similarly created by adding all medical consultations for these same disorders from the sexual abuse report to the end of the study period in 2013 for each abused child. The same period is used to create the dependent variable for the matched controls, which entails an equivalent observation period for each matched pair. See *[citations blinded for review]* for a description and sex differences of these disorders.

Two similar control and dependent variables were created using diagnoses for mental and behavioral disorders in the public health insurance database for inpatient or outpatient consultations between January 1, 1996, and March 31, 2013. Diagnoses were documented and classified according to ten major diagnostic categories of the 10th version (2008) of the ICD, excluding those for ID described previously (F70-79). They are: 1) Organic mental disorders, 2) Mental and behavioral disorders due to psychoactive substance use, 3) Schizophrenia, schizotypal and delusional disorders, 4) Mood disorders, 5) Neurotic, stress-related and somatoform disorders, 6) Behavioral syndromes associated with physiological disturbances and physical factors, 7) Disorders of adult personality and behavior, 8) Disorders of psychological development, 9) Behavioral and emotional disorders with onset usually occurring in childhood and adolescence, and 10) Unspecified mental disorders. All pre-report diagnoses were summed to create a control variable of mental health disorders, and all post-report diagnoses were added to create a mental health disorder dependent variable. See *[citations blinded for review]* for a description and sex differences of these disorders.

Sociodemographic control variables. Two variables were used to control participants' socioeconomic status in all analyses. These were the material and social deprivation indexes estimated via postal codes, which describe the socioeconomic level of a small geographical area where each participant resided at the time of the corroborated sexual abuse report *[citations blinded for review]*. Sex (male and female) documented from medical databases was also used as a control variable.

Statistical Analyses

Preliminary univariate analyses comparing the proportion of sexual abuse reports among children with and without ID were first conducted (chi^2). Preliminary univariate analyses were

also conducted to compare the average number of in and outpatient consultations for physical and mental health disorders, before and after the corroborated report of sexual abuse, among children with and without ID (ANOVA). A series of three conditional generalized linear mixed negative binomial regressions were used for each dependent variable. This enabled considering the matched design (Niven et al., 2012) and the skewness of health data. In addition to controlling for sex and age in the design for the first regression on CSA and material and social deprivation indexes in all regressions, we controlled for the number of mental health consultations before the sexual abuse report in the regression model on mental health disorders post-abuse report and similarly controlled for the regression on physical health consultations.

Results

The prevalence of ID was 2.7% for children with a corroborated sexual abuse report (n = 24) and 0.8% in the general population, matched group (n = 7; chi^2 = 9.49, p = .002). The total sample of children with ID, regardless of whether there is a sexual abuse report, is 31, or 1.8% of the total sample. When abused and matched-control groups were taken together, the proportion of ID was similar among boys (2.7%) and girls (1.4%, chi^2 = 3.13, p = .077). Among the 31 children with ID, 15 had varying levels of ID diagnosed over the study's 17 years of observation (n = 9 for mild and moderate, n = 3 for severe or profound with another mild or moderate and unspecified diagnosis, and n = 3 for mild or moderate with another unspecified diagnosis), while16 had the same level diagnosed throughout (mild or moderate = 5, severe or profound = 0, other or unspecified = 11). Before and after controlling for material and social deprivation indexes, the results of the regression analysis on group membership, i.e., the group with a corroborated report of sexual abuse vs the matched control group from the general population, revealed that children with ID were 3.5 times more likely to be in the abused group (Table 1). As

shown in Table 1, as material and social deprivation indexes increased, the risk of belonging to the abused group vs the general population increased. As the regression is conditioned on matching between the groups of children with CSA and those from the general population, sex and age are controlled for within the study design.

The unadjusted average number of consultations pre- and post-abuse report for physical and mental health disorders according to whether children have an ID are presented in Table 2. Results from analyses of variance, unadjusted for control variables, indicate that intellectually disabled children had more documented consultations for physical and mental health disorders before and after the corroborated sexual abuse report than their non-intellectually-disabled peers. The regression analyses on the number of physical and mental health consultations (Table 3) confirm this and reveal that when controlling for covariates, having an ID diagnosis remained associated with increased consultations post corroborated sexual abuse report. Thus, regardless of sex, previous consultations, corroborated sexual abuse, and material and social deprivation levels, children with ID consulted 1.9 times more often for physical health disorders and 2.3 times more often for mental health disorders post abuse report than their non-intellectually-disabled peers. In addition, controlling for ID, prior disorder diagnoses, and material and social deprivation, children with corroborated reports of CSA consulted 1.2 times and 3.3 times more often for physical and mental health disorders, respectively, than their matched peers from the general population.

Discussion

The current study's results align with the hypotheses that children with intellectual disabilities would be overrepresented in the abused group and consult more often than their non-intellectually disabled peers for physical and mental health disorders following the corroborated

sexual abuse report. These results align with previous studies that underlined this increased risk for sexual abuse (Jones et al., 2012), and physical and mental health disorders in children with ID (Buckley et al., 2020; Liao et al., 2021). In our study, the risk of sexual abuse for intellectually disabled children is in the higher range of prior study results (OR = 3.4, compared with 2.24 to 3.69 – Jones et al., 2012). The current study's rigorous design controlling for pre-existing physical and mental health disorders, sex, material and social deprivation, a matched general population control group, and a longitudinal design helps to ascertain this with more certainty. The current design has improved on prior results limited by small convenience or clinical samples, retrospective self-reported data, and cross-sectional designs that often lacked appropriate comparison groups (Brewin et al., 1993; O'Donnell et al., 2010; Straus, 1998).

Most importantly, prior studies never controlled for pre-existing conditions when assessing intellectually disabled children's physical and mental health disorders post-abuse. Our study thus sheds novel light on the probable increased consequences intellectually disabled children exhibit post sexual abuse report as both sexually abused and disabled children had more consultations post-abuse report. However, due to the small sample of children with ID in the general population group (n = 7), we could not test the interaction between abuse and disability. Testing this interaction effect is needed to determine whether sexual abuse entails more physical and mental health disorders post abuse report for those with ID than their non-intellectually disabled abused peers and the general population. Nonetheless, our study design and results bring us closer to an answer on this subject.

The study's results need to be interpreted in light of its limitations. First, the sequence of events was predicated on the date of the first sexual abuse report, without information on when the abuse started, its duration, and whether it occurred before the ID or other diagnoses. This

limit is somewhat offset by including a control group without ID and another from the general population. Second, children from the general population cannot be presumed without abuse as they could have been abused without it being reported or corroborated. This limit underestimates the risk of abuse among children with and without ID and their risk of disorders post-abuse report. Third, the sexually abused group of children was sampled from official child protection records of corroborated sexual abuse, representing only around 10% of all childhood sexual abuse cases (Afifi et al., 2015). We thus lack information on children whose abuse was not reported to authorities, and our results cannot be generalized to all sexually abused children, regardless of ID. Fourth, although ID are associated with the highest risk of maltreatment (Maclean et al., 2017), our study's sole focus on ID may also have underestimated the association between disabilities in general and abuse or disorders and entailed a smaller sample of children in the ID group, which itself precluded conducting interaction analyses. Among other limitations, the administrative databases lacked some information (e.g. no non-binary sex data), and the current design omitted some information. For example, only the first sexual abuse report was used to determine pre and post-abuse observation periods for documenting physical and mental health disorder consultations, which did not allow assessing the effect of repeated sexual abuse.

Conclusions and recommendations

Children with ID are clearly more at risk of abuse and physical and mental health disorders post-abuse report than their non-disabled peers. They may also be more susceptible to the detrimental effects of sexual abuse. However, despite this increased risk of abuse and adversity, there is a lack of intervention and prevention efforts tailored to their specific needs (Baker et al., 2021; Dion et al., 2013; Legano et al., 2021). Therefore, researchers and clinicians

need to join their efforts to better respond to the needs of these more vulnerable children and foster their positive development. Moreover, further studies with larger population samples or oversampling for children with disabilities, including more forms of disabilities, are clearly needed.

References

Afifi, T. O., MacMillan, H. L., Taillieu, T., Cheung, K., Turner, S., Tonmyr, L., & Hovdestad, W. (2015). Relationship between child abuse exposure and reported contact with child protection organizations: Results from the Canadian Community Health Survey. *Child Abuse & Neglect, 46*, 198-206. https://doi.org/http://dx.doi.org/10.1016/j.chiabu.2015.05.001

Águila-Otero, A., González-García, C., Bravo, A., Lázaro-Visa, S., & del Valle, J. F. (2018). Children and young people with intellectual disability in residential childcare: Prevalence of mental health disorders and therapeutic interventions. *International Journal of Social Welfare, 27*(4), 337-347. https://doi.org/https://doi.org/10.1111/ijsw.12351

Akbaş, S., Turla, A., Karabekiroğlu, K., Pazvantoğlu, O., Keskin, T., & Böke, O. (2009). Characteristics of sexual abuse in a sample of Turkish children with and without mental retardation, referred for legal appraisal of the psychological repercussions. *Sexuality and Disability, 27*(4), 205-213. https://doi.org/10.1007/s11195-009-9139-7

Baker, K., Devine, R. T., Ng-Cordell, E., Raymond, F. L., & Hughes, C. (2021). Childhood intellectual disability and parents' mental health: integrating social, psychological and genetic influences. *The British Journal of Psychiatry*, *218*(6), 315-322. https://doi.org/10.1192/bjp.2020.38

Berg, K. L., Shiu, C. S., Msall, M. E., & Acharya, K. (2015). Victimization and depression among youth with disabilities in the US child welfare system. *Child Care Health Dev, 41*(6), 989-999. https://doi.org/10.1111/cch.12233

Black, N. (1996). Why we need observational studies to evaluate the effectiveness of health care. *BMJ: British Medical Journal*, *312*(7040), 1215.

Brewin, C. R., Andrews, B., & Gotlib, I. H. (1993). Psychopathology and early experience: a reappraisal of retrospective reports. *Psychological Bulletin, 113*(1), 82.

Buckley, N., Glasson, E. J., Chen, W., Epstein, A., Leonard, H., Skoss, R., Jacoby, P., Blackmore, A. M., Srinivasjois, R., Bourke, J., Sanders, R. J., & Downs, J. (2020). Prevalence estimates of mental health problems in children and adolescents with intellectual disability: A systematic review and meta-analysis. *Aust N Z J Psychiatry, 54*(10), 970-984. https://doi.org/10.1177/0004867420924101

Byrne, G. (2018). Prevalence and psychological sequelae of sexual abuse among individuals with an intellectual disability: A review of the recent literature. *J Intellect Disabil, 22*(3), 294-310. https://doi.org/10.1177/1744629517698844

Carrellas, A., Resko, S. M., & Day, A. G. (2021). Sexual victimization and intellectual disabilities among child welfare involved youth. *Child Abuse & Neglect, 115*, 104986. https://doi.org/https://doi.org/10.1016/j.chiabu.2021.104986

Collin-Vezina, D., Daigneault, I., & Hébert, M. (2013). Lessons learned from child sexual abuse research: prevalence, outcomes, and preventive strategies. *Child and Adolescent Psychiatry and Mental Health, 7*(1), 1-9. https://doi.org/10.1186/1753-2000-7-22

Daigneault, I., Vézina-Gagnon, P., Bourgeois, C., Esposito, T., & Hébert, M. (2017). Physical and mental health of children with substantiated sexual abuse: Gender comparisons from a matched-control cohort study. *Child Abuse & Neglect, 66*, 155-165. https://doi.org/http://doi.org/10.1016/j.chiabu.2017.02.038

Dion, J., Paquette, G., Tremblay, K.-N., Collin-Vézina, D., & Chabot, M. (2018). Child Maltreatment Among Children With Intellectual Disability in the Canadian Incidence

Study. *American Journal on Intellectual and Developmental Disabilities, 123*(2), 176-188. https://doi.org/10.1352/1944-7558-123.2.176

Dion, J., Paquette, G., Tremblay, K. N., Dionne, C., & Cyr, M. (2013). Sexual abuse of intellectually disabled youths: A review. *The Prevention Researcher, 20*(3), 14-16.

Euser, S., Alink, L. R. A., Tharner, A., van Ijzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2016). The Prevalence of Child Sexual Abuse in Out-of-home Care: Increased Risk for Children with a Mild Intellectual Disability. *Journal of Applied Research in Intellectual Disabilities, 29*(1), 83-92. https://doi.org/10.1111/jar.12160

Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2009). Lifetime assessment of poly-victimization in a national sample of children and youth. *Child Abuse Negl, 33*(7), 403-411. https://doi.org/10.1016/j.chiabu.2008.09.012

Fisher, M., Hodapp, R., & Dykens, E. (2008). Child Abuse Among Children with Disabilities: What We Know and What We Need to Know. *International Review of Research in Mental Retardation, 35*, 251-289. https://doi.org/10.1016/S0074-7750(07)35007-6

Hélie, S., Collin-Vézina, D., Turcotte, D., Trocmé, N., & Girouard, N. (2017). *Étude d'incidence québécoise sur les situations évaluées en protection de la jeunesse en 2014 (ÉIQ-2014)*. http://centrejeunessedemontreal.qc.ca/recherche/PDF/Publications/Rapport/RapportFinal_EIQ2014.pdf

Hillberg, T., Hamilton-Giachritsis, C., & Dixon, L. (2011). Review of meta-analyses on the association between child sexual abuse and adult mental health difficulties: A systematic approach. *Trauma, Violence, & Abuse, 12*(1), 38-49. https://doi.org/http://dx.doi.org/10.1177/1524838010386812

Horner-Johnson, W., & Drum, C. E. (2006). Prevalence of Maltreatment of People with Intellectual Disabilities: A Review of Recently Published Research. *Mental Retardation and Developmental Disabilities Research Reviews, 12*(1), 57-69. http://dx.doi.org/10.1002/mrdd.20097

Irish, L., Kobayashi, I., & Delahanty, D. L. (2010). Long-term physical health consequences of childhood sexual abuse: a meta-analytic review. *Journal of Pediatric Psychology, 35*(5), 450-461.

Jenkins, B. Q., Tilbury, C., Mazerolle, P., & Hayes, H. (2017). The complexity of child protection recurrence: The case for a systems approach. *Child Abuse Negl, 63*, 162-171. https://doi.org/10.1016/j.chiabu.2016.11.020

Jones, L., Bellis, M. A., Wood, S., Hughes, K., McCoy, E., Eckley, L., Bates, G., Mikton, C., Shakespeare, T., & Officer, A. (2012 Prevalence and risk of violence against children with disabilities: a systematic review and meta-analysis of observational studies. *The Lancet, 380*(9845), 899-907. https://doi.org/https://doi.org/10.1016/S0140-6736(12)60692-8

Legano, L. A., Desch, L. W., Messner, S. A., et al., AAP Council on Child Abuse and Neglect, AAP Council on Children With Disabilities, (2021). Maltreatment of Children With Disabilities. *Pediatrics, 147*(5). https://doi.org/10.1542/peds.2021-050920

Liao, P., Vajdic, C., Trollor, J., & Reppermund, S. (2021). Prevalence and incidence of physical health conditions in people with intellectual disability - a systematic review. *Plos One, 16*(8), e0256294. https://doi.org/10.1371/journal.pone.0256294

Lightfoot, E. (2014). Children and Youth with Disabilities in the Child Welfare System: An Overview. *Child Welfare, 93*(2), 23-46. https://www.jstor.org/stable/48623428

Maclean, M., Sims, S., Hansen, M., Leonard, H., Bourke, J., Bower, C., & O'Donnell, M. (2017). Abuse and neglect in children with disabilities: risk varies by type of disability: IJPDS (2017) Issue 1, Vol 1:177, Proceedings of the IPDLN Conference (August 2016). *International Journal of Population Data Science, 1*(1). https://doi.org/10.23889/ijpds.v1i1.197

Mathews, B., Bromfield, L., Walsh, K., Cheng, Q., & Norman, R. E. (2017). Reports of child sexual abuse of boys and girls: Longitudinal trends over a 20-year period in Victoria, Australia. *Child Abuse & Neglect, 66*, 9-22. https://doi.org/https://doi.org/10.1016/j.chiabu.2017.01.025

Maulik, P. K., Mascarenhas, M. N., Mathers, C. D., Dua, T., & Saxena, S. (2011). Prevalence of intellectual disability: A meta-analysis of population-based studies. *Research in developmental disabilities, 32*(2), 419-436. https://doi.org/https://doi.org/10.1016/j.ridd.2010.12.018

Niven, D. J., Berthiaume, L. R., Fick, G. H., & Laupland, K. B. (2012). Matched case-control studies: a review of reported statistical methodology. *Clinical Epidemiology, 4*, 99-110. https://doi.org/10.2147/CLEP.S30816

O'Donnell, M., Nassar, N., Leonard, H., Jacoby, P., Mathews, R., Patterson, Y., & Stanley, F. (2010). Rates and types of hospitalisations for children who have subsequent contact with the child protection system: a population based case-control study. Journal of epidemiology and community health. *Journal of Epidemiology and Community Health, 64*, 784-788.

Paquette, G., Bouchard, J., Dion, J., Tremblay, K. N., Tourigny, M., Tougas, A.-M., & Hélie, S. (2018). Factors associated with intellectual disabilities in maltreated children according to

caseworkers in child protective services. *Children and Youth Services Review, 90*, 38-45. https://doi.org/https://doi.org/10.1016/j.childyouth.2018.05.004

Stalker, K., & McArthur, K. (2012). Child abuse, child protection and disabled children: a review of recent research. *Child Abuse Review, 21*(1), 24-40. https://doi.org/https://doi.org/10.1002/car.1154

Stoltenborgh, M., van Ijzendoorn, M. H., Euser, E. M., & Bakermans-Kranenburg, M. J. (2011). A global perspective on child sexual abuse: Meta-analysis of prevalence around the world. *Child Maltreatment, 16*(2), 79-101.

Straus, M. A. (1998). Identification of Child Maltreatment with the Parent-Child Conflict Tactics Scales: Development and Psychometric Data for a National Sample of American Parents. *Child Abuse & Neglect, 22*(4), 249-265.

Sullivan, P. M., & Knutson, J. F. (2000). Maltreatment and disabilities: a population-based epidemiological study. *Child Abuse & Neglect, 24*(10), 1257-1273. https://doi.org/http://dx.doi.org/10.1016/S0145-2134(00)00190-3

Vachon, D. D., Krueger, R. F., Rogosch, F. A., & Cicchetti, D. (2015). Assessment of the harmful psychiatric and behavioral effects of different forms of child maltreatment. *JAMA Psychiatry, 72*(11), 1135-1142. https://doi.org/10.1001/jamapsychiatry.2015.1792

Wekerle, C., & Black, T. (2017). Gendered violence: Advancing evidence-informed research, practice and policy in addressing sex, gender, and child sexual abuse. *Child Abuse & Neglect, 66*, 166-170. https://doi.org/https://doi.org/10.1016/j.chiabu.2017.03.010

Wekerle, C., Goldstein, A. L., Tanaka, M., & Tonmyr, L. (2017). Childhood sexual abuse, sexual motives, and adolescent sexual risk-taking among males and females receiving child

welfare services. *Child Abuse & Neglect, 66*, 101-111. https://doi.org/https://doi.org/10.1016/j.chiabu.2017.01.013

Wissink, I. B., Van Vugt, E., Moonen, X., Stams, G. J. J., & Hendriks, J. (2015). Sexual abuse involving children with an intellectual disability (ID): a narrative review. *Research in developmental disabilities, 36*, 20-35. https://doi.org/10.1016/j.ridd.2014.09.007

Table 1. Two Regression Models of Intellectual Disability on Child Sexual Abuse Unadjusted and Adjusted Social and Material Deprivation.

	Estimate	Standard error	Wald Chi^2	*p*	Exp(B)	95% CI for Exp(B) LL, UL
Unadjusted Model						
Intercept	-0.020	0.006	9.322	.002	0.981	[0.968, 0.993]
Intellectual Disabilities	1.252	0.435	8.283	.004	3.497	[1.491, 8.201]
Adjusted Model						
Intercept	-0.020	0.011	3,206	.981	0.973	[0.960, 1.002]
Intellectual Disabilities	1.230	0.437	7.925	.005	3.422	[1.453, 8.060]
Material deprivation	0.232	0.048	22.966	.000	1.261	[1.147, 1.386]
Social deprivation	0.236	0.049	23.523	.000	1.267	[1.151, 1.394]

Note. Sex and age are controlled for by the matched design and the regression being conditioned on matching. Exp(B) = exponentiation of the estimate, or odds ratio, CI = Confidence Interval, LL = lower limit, UL = upper limit.

Table 2. Unadjusted Mean Number of Consultations for Physical and Mental Health Disorders Pre and Post-Abuse Report Comparing all Children With and Without Intellectual Disability and Analysis of Variance Results.

	Intellectual Disabilities			
	Yes *n* = 31	No *n* = 1733		
	Mean (SD)	*Mean (SD)*	*F*	*p*
Physical Health Disorders				
Pre-report	40.48 (50.69)	21.30 (23.31)	19.40	.000
Post-report	36.03 (48.88)	17.58 (21.85)	20.35	.000
Mental Health Disorders				
Pre-report	28.81 (43.13)	3.19 (13.71)	92,29	.000
Post-report	30.71 (53.01)	8.35 (29.18)	17.12	.000

Note. *SD* = standard deviation

Table 3. Regression Model of Intellectual Disability on Mental Health and Physical Health Disorder Consultations Post Abuse Report Controlling for Pre-Report Disorder Consultations, Sex, Material and Social Deprivation.

	Physical Health Disorder Consultations					
	Estimate	Standord Error	Wald Chi^2	*p*	Exp(B)	95% CI Exp(B) LL, UL
Intercept	3.111	.191	266.464	.000	22.443	[15.447, 32.606]
Intellectual Disabilities	.647	.186	12.157	.000	1.908	[1.328, 2.747]
Sex at Birth	.384	.057	45.379	.000	1.468	[1.313, 1.642]
Sexual Abuse Report	.183	.050	13.494	.000	1.201	[1.089, 1.324]
Material Deprivation	.067	.025	7.386	.007	1.070	[1.019, 1.123]
Social Deprivation	.007	.025	.074	.785	1.007	[0.959, 1.057]
Physical Health Disorder Consultations pre-Report	.108	.025	19.566	.000	1.115	[1.062, 1.169]
	Mental Health Disorder Consultations					
	Estimate	Standord Error	Wald	*p*	Exp(B)	95% CI Exp(B) LL, UL
Intercept	2.269	.196	134.417	.000	9.674	[6.592, 14.198]
Intellectual Disabilities	0.851	.190	19.993	.000	2.342	[1.613, 3.401]
Sex at Birth	-0.172	.060	8.381	.004	0.842	[0.749, 0.946]
Sexual Abuse Report	1.208	.053	518.371	.000	3.348	[3.017, 3.714]
Material Deprivation	-0.018	.026	.468	.494	0.982	[0.933, 1.034]
Social Deprivation	0.097	.026	13.725	.000	1.102	[1.047, 1.160]
Mental Health Disorder Consultations pre-Report	0.207	.025	67.751	.000	1.230	[1.171, 1.292]

Note. Exp(B) = Exponentiation of the estimate, or odds ratio, CI = confidence interval, LL = lower limit, UL = upper limit