

Risk Factors for Maltreatment in Siblings of Abused Children

Steve Kisely, MD, PhD, DMedRes,^{a,b,c} Lane Strathearn, MBBS, FRACP, PhD,^{d,e} Jake M. Najman, PhD, FASSA^f

abstract

OBJECTIVES: To examine the association between child maltreatment (abuse and neglect) in one sibling and that in another as well as associated risk factors.

METHODS: The participants were 520 sibling pairs enrolled in a population-based birth cohort study in Brisbane, Australia ($N = 1040$). Exposure to suspected child maltreatment was measured by linkage with state child protection agency data. Self-reports of childhood sexual abuse were also collected at the 21-year follow-up.

RESULTS: There were notifications in both children for 8.5% of the sibling pairs ($n = 44$). A notification in the first sibling was associated with a 60-fold increase in the likelihood of a notification in the second sibling (95% confidence interval: 29.3–125.1), resulting in nearly three-quarters being the subject of a report. In terms of the subtypes, neglect revealed the strongest association, followed by sexual abuse. At the 21-year follow-up, 58% of second siblings reported sexual abuse when the first sibling disclosed similar experiences. On adjusted analyses, maternal age of <20 years was the strongest and most consistent predictor of abuse, with indigenous status, maternal depression, parental relationship, and familial poverty playing a lesser role.

CONCLUSIONS: Our results highlight the close association between child abuse in one sibling and maltreatment in a second sibling as well as possible risk factors. Greater awareness of these factors may inform interventions, particularly primary and secondary prevention.



^aSchool of Medicine, The University of Queensland and Princess Alexandra Hospital, Woolloongabba, Queensland, Australia; ^bDepartments of Psychiatry and ^cCommunity Health and Epidemiology, Dalhousie University, Halifax, Nova Scotia, Canada; ^dStead Family Department of Pediatrics, University of Iowa, Iowa City, Iowa; ^eCenter for Disabilities and Development, University of Iowa Stead Family Children's Hospital, Iowa City, Iowa; and ^fSchool of Public Health, The University of Queensland, Herston, Queensland, Australia

Dr Strathearn conceptualized and designed the original study linking the Mater-University of Queensland Study of Pregnancy data set with notifications of child maltreatment and critically revised the manuscript for important intellectual content; Dr Najman was the original principal investigator of the Mater-University of Queensland Study of Pregnancy and had the idea for investigating risk factors for child maltreatment in siblings and critically revised the manuscript for important intellectual content; Dr Kisely developed the analysis plan, undertook the analyses, and wrote the first draft; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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Address correspondence to Steve Kisely, MD, PhD, DMedRes, Princess Alexandra-Southside Clinical Unit, School of Clinical Medicine, Faculty of Medicine, The University of Queensland and Princess Alexandra Hospital, Level 4, Building 1, Ipswich Rd, Woolloongabba, QLD 4102, Australia.
E-mail: s.kisely@uq.edu.au

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WHAT'S KNOWN ON THIS SUBJECT: Researchers have reported higher rates of maltreatment in siblings of children who are maltreated. However, they are generally based on selected samples and do not cover all childhood and adolescence or include a range of agency- and self-reported maltreatment subtypes.

WHAT THIS STUDY ADDS: Our results from a population-based birth cohort highlight the association between maltreatment in one sibling and that in a second for several agency- and self-reported types. Younger maternal age was the strongest risk factor. This could inform targeted assistance.

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Child maltreatment is common, whether this is sexual abuse, physical abuse, emotional abuse, or neglect.¹⁻³ For instance, 3.5 million children in the United States are reported to statutory agencies each year, resulting in an annual substantiated rate of 9.1 per 1000 children.⁴ The consequences are diverse and wide ranging⁴ and account for a substantial disease burden.⁵ Examples include long-term cognitive, psychological, addiction, sexual health, and physical health problems.⁴ Although a good deal is known about children's experiences of maltreatment, there is less information about those of their siblings. Although siblings share parents, physical environments, and many biological characteristics, it is unclear whether they experience similar forms or levels of maltreatment. If siblings of a child who is maltreated are also at increased risk of maltreatment, interventions should both anticipate possible future maltreatment in siblings and address the broader context contributing to maltreatment in a family.

There have been few previous studies of abuse in siblings of children who were maltreated. The authors of one early British study used police records of children who had experienced maltreatment and reported similar reports on multiple children from the same households.⁶ However, this article was largely focused on parental psychiatric, criminal justice, and substance use history. The author of a later US study of 366 youth found that some families were the subject of multiple reports, although there was less information on the level of increased risk and for which specific maltreatment type.⁷ Of the 3 remaining studies of sibling maltreatment, 2 were focused specifically on physical abuse⁸ or children who were severely abused,⁹ whereas the third involved interviews with 59 sibling pairs to assess reports of neglectful parenting.¹⁰ The authors

of these studies all reported that siblings of children who were maltreated were more likely to experience physical or severe abuse.

Areas that require further clarification include the level of increased risk for a range of maltreatment subtypes as well as the extent to which different reporting sources for maltreatment in siblings reveal a similar pattern in the same sample.

We therefore compared 2 reporting sources of child maltreatment using birth cohort data on siblings born during the 3-year recruitment period.¹¹ There were 2 sources of information on child maltreatment. One was notifications to statutory agencies, and the second was retrospective reports of sexual abuse provided by respondents when they were 21 years of age. We considered 4 specific forms of agency-notified child maltreatment: neglect, physical, sexual, and emotional abuse. We compared siblings in the same family for all maltreatment types.

METHODS

In this longitudinal birth cohort study, we investigated the likelihood and predictors of agency-notified childhood maltreatment in a child after a similar notification on an older sibling. We used data from the Mater-University of Queensland Study of Pregnancy, (MUSP), The University of Queensland Behavioral and Social Sciences Ethical Review Committee approved the protocol, and we followed Strengthening the Reporting of Observational Studies in Epidemiology guidelines for the conduct of cohort studies.¹²

Data Sources

Baseline data were collected at the first antenatal visit from 7223 consecutive women who received antenatal care at the Mater Misericordiae Mothers' Hospital from 1981 to 1984. Both mothers and

infants were assessed at birth.¹¹ We report on 520 sibling pairs who were live singleton births and left the hospital alive with their biological mothers during the 3-year recruitment period ($N = 1040$).

Agency-Reported Child Maltreatment (Notified and/or Substantiated)

Information on child maltreatment came from notifications or reports to Queensland's child protection agency, the Department of Families, Youth, and Community Care. These data were linked anonymously to the MUSP longitudinal data set by using a unique identification number.¹³ We included all notifications to the Department of Families, Youth, and Community Care up to September 2000, at which time the youngest members of the cohort were 16.5 years old. These notifications could come from the community or health workers and were divided into the following maltreatment types: physical, sexual, or emotional abuse and/or neglect. These notifications were then investigated by officers from the child protection agency, who substantiated them after a formal investigation to determine if there was "reasonable cause to believe that the child had been, was being, or was likely to be abused or neglected."

Child Sexual Abuse Measures

Twenty-one years later, 354 of the 520 sibling pairs (68.1%) completed a self-report measure on sexual abuse as part of the larger MUSP study.¹⁴ Questions were based on previous work from the United States and Australia,^{15,16} and have been used in similar studies.^{17,18} The participants were asked if they had experienced any of the following events before 16 years old: "Someone exposed themselves or masturbated in front of you"; "Someone more than 5 years older than you kissed or fondled your breasts or genitals"; "You touched or masturbated the genitals of someone more than 5 years older than you"; "Someone more than 5 years older

than you had sexual intercourse with you”; and “Someone more than 5 years older than you had oral sex with you.”

Potential Predictor Variables

We investigated the role of the following variables that were measured on entry to the study: sex of both children, time between each birth, racial background, maternal age, family income at study entry (first prenatal visit), baseline maternal education, and the mother’s marital relationship and mood status at the birth of each child. Maternal experiences of depression were measured by using the depression subscale of the Delusions-Symptoms-States Inventory.¹⁹ This 7-item subscale is based on a hierarchical model of mental illness; we used a cutoff score of 4 to determine “caseness.” The subscale has high reliability and has been validated against patient groups receiving treatment.¹⁹

Statistical Analysis

We initially performed a cross-tabulation of the association between maltreatment in the 2 siblings and any associated demographic factors. We considered overall abuse as well as each of the following subtypes: emotional, physical, and sexual abuse and neglect. We did the same for substantiated cases, along with the subtypes as above. Bivariate associations between maltreatment in the 2 siblings were assessed by using relative risk (RR). We then used a multinomial logistic regression analysis to measure the strength of association between demographic factors and child maltreatment in 1 or both siblings.

We performed several sensitivity analyses. Firstly, we investigated the effect of alternating the mother’s relationship and psychiatric status at the birth of the first and second child in the models. Secondly, we repeated the analysis on the dichotomized

variable of no maltreatment versus agency-reported abuse in both children.

RESULTS

Of the 520 sibling pairs ($N = 1040$), 261 firstborns were female (50.2%) and 259 (49.8%) were male. In terms of notified maltreatment, 64 firstborns (12.3%) had been the subject of a notification by 16 years of age. In order of frequency, these notifications were for neglect ($n = 47$), physical abuse ($n = 37$), emotional abuse ($n = 30$), and sexual abuse ($n = 23$). Eighteen firstborns were notified by 5 years old. Notifications were substantiated in 44 (8.5%), with neglect being the most common ($n = 24$), followed by physical ($n = 23$), emotional ($n = 14$), and sexual maltreatment ($n = 14$). There was self-reported sexual abuse in 96 (18.5%) of the 354 siblings who completed the measure at the 21-year follow-up. Of those 96 participants, 53 were female (55.2%) and 43 (44.8%) were male.

The second siblings were born an average of 1.71 years ($SD = 0.41$) after the first sibling. Unlike the firstborns, more second-born siblings were male (51.9%). However, the number of overall notifications for the second-born siblings was similar to that of firstborns ($n = 60$; 19 of which were by 5 years old), as were the numbers of notifications for each subtype: neglect ($n = 41$), physical abuse ($n = 38$), emotional abuse ($n = 28$), and sexual abuse ($n = 17$). The same applied to substantiated cases ($n = 38$), with subtypes as follows: neglect ($n = 22$), physical abuse ($n = 20$), emotional abuse ($n = 16$), and sexual abuse ($n = 9$). Eighty-eight (16.9%) had self-reported sexual abuse, of whom 50 (56.8%) were female.

There were notifications in both children for 8.5% of the sibling pairs ($n = 44$). A notification in the first sibling was associated with a 60-fold

increase in the likelihood of a notification in the second sibling, resulting in nearly three-quarters being the subject of a report (Table 1). In terms of the subtypes, neglect in one sibling revealed the strongest association with that in the other, followed by sexual abuse on both siblings and then emotional abuse (Table 1). The association was even stronger for substantiated abuse with, again, neglect and sexual abuse accounting for much of the effect (Table 1).

There was a weaker association between specific maltreatment subtypes in one sibling and different subtypes in the second. Results were only significant for 2 categories: physical abuse, whether notified (5 of 22 vs 32 of 498; $RR = 3.84$; 95% confidence interval [CI]: 1.52–9.80) or substantiated (3 of 18 vs 20 of 502; $RR = 3.11$; 95% CI: 1.35–13.9), and sexual abuse, whether notified (6 of 43 vs 17 of 477; $RR = 3.51$; 95% CI: 1.64–7.46) or substantiated (3 of 29 vs 11 of 491; $RR = 4.17$; 95% CI: 1.42–12.2).

In terms of retrospective self-reports, 58% of second-born siblings reported sexual abuse when the firstborn disclosed similar experiences (Table 1). However, the odds ratio was lower than that for agency-reported maltreatment (notified and/or substantiated) (Table 1).

Table 2 reveals the association between baseline demographic variables and notifications on 1 ($n = 36$) or both siblings ($n = 44$). On bivariate analyses, all the following were associated with agency-notified abuse on both siblings: female sex (first sibling), indigenous status, baseline maternal age of <20 years, low family income at study entry, no maternal education beyond high school, and parents not living together at the time of either the first or second birth. Maternal depression at the birth of each sibling was also associated with notification for

TABLE 1 Associations Between Maltreatment in One Sibling and That in the Other

Maltreatment in First Sibling	Maltreatment in Second Sibling						Significance	
	No			Yes				
	<i>n</i> (Notifications)	<i>n</i> (Siblings)	%	<i>n</i> (Notifications)	<i>n</i> (Siblings)	%	RR	95% CI
Any notifications	20	460	4.3	44	60	73.3	19.6	11.8–32.6
Sexual abuse	11	503	2.2	12	17	70.6	51.8	19.9–134.9
Physical abuse	16	482	3.3	21	38	55.3	16.8	9.7–29.0
Emotional abuse	14	492	2.8	16	28	57.1	21.8	11.4–41.8
Neglect	12	479	2.5	35	41	85.4	58.7	26.1–132.3
Substantiated notifications	16	482	3.3	28	38	73.7	30.2	15.8–58.2
Sexual abuse	7	511	1.4	7	9	77.8	126.5	28.8–555.2
Physical abuse	12	500	2.4	11	20	55.0	26.4	12.2–57.6
Emotional abuse	6	504	1.2	8	16	50.0	36.1	15.9–52.4
Neglect	7	498	1.4	17	22	77.3	70.3	28.3–174.4
Self-reported sexual abuse	45	266	16.9	51	88	58.0	3.70	3.98–11.5

maltreatment. The sex of the second-born sibling and time between the 2 births had no effect (Table 2).

However, on multivariate analysis, the only variables that revealed a significant association with notified abuse in both siblings were female sex (first sibling only), indigenous status, and maternal age <20 (Table 3).

In terms of the subtypes, younger maternal age revealed the most consistent association on adjusted analyses. This includes notified and substantiated physical or emotional abuse as well as neglect (Table 4). Indigenous status was associated with neglect (adjusted odds ratio [aOR] = 1.91; 95% CI: 1.14–3.15; $P = .012$), including substantiated notifications (aOR = 2.39; 95% CI: 1.27–4.52; $P = .007$). Maternal depression at the first birth was also associated with notifications for neglect (aOR = 3.11; 95% CI: 1.00–9.83; $P = .05$) as well as physical abuse (aOR = 1.91; 95% CI: 1.14 = 3.15; $P = .012$). The only variable associated with sexual abuse was poverty in the case of substantiated notifications (aOR = 9.43; 95% CI: 1.09–81.5; $P = .04$). Notifications by 5 years of age and self-reported sexual abuse revealed no associations with any variable.

Substituting maternal depression at the birth of the second child for mood at the birth of the first child did not alter the results. For instance, notified abuse in both siblings remained associated with indigenous status (aOR = 1.78; 95% CI: 1.09–2.89; $P = .021$) and maternal age <20 (aOR = 2.87; 95% CI: 1.31–6.27; $P = .008$). However, relationship status in terms of the parents not living together at the time of the second birth did reveal a significant relationship with maltreatment in both children (aOR = 3.41; 95% CI: 1.24–9.41; $P = .018$), as did maternal age <20 (aOR = 2.26; 95% CI: 1.05–4.86; $P = .036$). Indigenous status was no longer significant.

Repeating the analysis on the dichotomized variable of no maltreatment versus agency-reported abuse in both children gave similar results to those of the multinomial logistic regression. For instance, notified abuse in both siblings was still associated with indigenous status (aOR = 1.71; 95% CI: 1.03–2.85; $P = .037$) and maternal age <20 (aOR = 2.78; 95% CI: 1.24–6.21; $P = .013$).

DISCUSSION

We assessed the prevalence and predictors of agency-notified maltreatment in a second-born

sibling after notification in a firstborn. To our knowledge, this is the first population-based study in which both a wide range of subtypes, including notified and/or substantiated neglect, physical abuse, emotional abuse, and sexual abuse, and retrospective self-reports of sexual abuse are examined. As in 1-year prevalence studies of maltreatment in children as a whole, proportions of subtypes were similar, with neglect being the most common, followed by physical, emotional, and sexual abuse.²⁰

Notifications for maltreatment in the second-born child revealed a strong association with notifications in the firstborn. For instance, nearly 75% of the second-born siblings were subject to a notification, and this increased to 85% for neglect. Sexual abuse was the next most common. In general, the same type of maltreatment occurred in both siblings. These high rates in the 2 siblings are consistent with official data from the United Kingdom on the percentage of cases in which at least 1 sibling was on the Child Protection Register in England and Wales for the same type of abuse as the index child.⁶ As in this study, the most common type was neglect (60%). Rates are also similar to those in a British study in which 72% of siblings also experienced abuse, 63% of which was rated as moderate or severe.⁹

There are less data on comparisons using retrospective reports of abuse. In 1 study of 97 sister pairs, more than three-quarters reported similar experiences, with highest levels of agreement for neglect (90%) and physical and sexual abuse (77%). These levels are higher but still consistent with the 58% for sexual abuse in our study.²¹ Length of follow-up is unlikely to be the reason for any difference because the age in that study was between 20 and 50 years old. A possible explanation is the sampling strategy, in that the sisters were specially selected so that more than half had adverse childhood experiences.²¹

TABLE 2 Variables Associated With Maltreatment in Both Siblings

	Notifications			Significance
	0 Siblings (<i>n</i> = 440)	1 Sibling (First or Second) (<i>n</i> = 36)	2 Siblings (First and Second) (<i>n</i> = 44)	
Sex of first sibling, <i>n</i> (%)				$\chi^2 = 9.901; P = .007$
Male	219 (49.8)	25 (69.4)	15 (34.1)	
Female	221 (50.2)	11 (30.6)	29 (65.9)	
Sex of second sibling, <i>n</i> (%)				$\chi^2 = 1.025; P = .599$
Male	225 (51.1)	19 (52.8)	26 (59.1)	
Female	215 (48.9)	17 (47.2)	18 (40.9)	
Difference in ages, mean (SD)	1.79 (0.46)	1.79 (0.46)	1.66 (0.45)	$F = 0.88; P = .415$
Racial origin, ^a <i>n</i> (%)				$\chi^2 = 9.237; P = .010$
Non-indigenous ^b	419 (95.2)	33 (91.7)	37 (84.1)	
Indigenous	21 (4.9)	3 (8.3)	7 (15.9)	
Baseline age of mother, <i>y</i> , <i>n</i> (%)				$\chi^2 = 22.213; P < .0001$
<20	373 (84.8)	23 (63.9)	27 (61.4)	
≥20	67 (15.2)	13 (36.1)	17 (38.6)	
Maternal education, <i>n</i> (%)				$\chi^2 = 7.986; P = .018$
Post high school	74 (16.8)	3 (8.3)	1 (2.3)	
No post high school	366 (83.2)	33 (91.7)	43 (97.7)	
Living together (first sibling), <i>n</i> (%)				$\chi^2 = 20.146; P < .0001$
Living together	406 (92.3)	26 (72.2)	35 (79.5)	
Not in a relationship	34 (7.7)	10 (27.8)	9 (20.5)	
Living together (second sibling), <i>n</i> (%)				$\chi^2 = 18.070; P < .0001$
Living together	420 (95.5)	34 (94.4)	35 (79.5)	
Not in a relationship	20 (4.5)	2 (5.6)	9 (20.5)	
Baseline recoded income, <i>n</i> (%)				$\chi^2 = 8.413; P = .015$
≥\$10 400	299 (68.0)	19 (52.8)	22 (50.0)	
≤\$10 399	141 (32.0)	17 (47.2)	22 (50.0)	
Maternal depression at birth of first sibling, <i>n</i> (%)				$\chi^2 = 13.79; P = .001$
Not depressed	421 (96.3)	34 (97.1)	37 (84.1)	
Depressed	16 (3.7)	1 (2.9)	7 (15.9)	
Maternal depression at birth of second sibling, <i>n</i> (%)				$\chi^2 = 6.18; P = .046$
Not depressed	427 (97.0)	33 (91.7)	40 (90.9)	
Depressed	13 (3.0)	3 (8.3)	4 (9.1)	

^a Self-identified by parents at baseline.

^b Includes 20 sibling pairs of Asian origin with the white group because differences in notifications were nonsignificant ($\chi^2 = 3.947$, degree of freedom = 2, $P = .139$).

There was less concordance between siblings in self-reported sexual abuse as opposed to agency-reported maltreatment. The reasons are unclear. Self-reports may be based on standards that are family specific and may also be less influenced by institutional issues, such as a lower threshold for reporting suspected cases in the presence of previous notifications on another sibling.

A strength of the current study is the identification of factors at the sibling's birth that were associated with a range of subsequent maltreatment types. Of these, maternal age of <20 years was the strongest and most consistent predictor of abuse overall as well as the physical abuse, emotional abuse, and neglect subtypes, whether

substantiated or notified. Indigenous status was associated with overall notifications as well as notified or substantiated neglect. Other factors such as maternal depression, low familial income, relationship status, and sibling sex revealed a less consistent association, whereas maternal education and differences in sibling ages had no effect.

There are several possible explanations for the higher rate in teenage mothers and those from an indigenous background. One is social disadvantage (including racial discrimination) and the consequent need for additional support in early parenthood. One example of additional support is perinatal home visiting, although the evidence for effectiveness is mixed.²² The most

successful was the Nurse Family Partnership Program, which targeted poor, unmarried women aged <19 years.²³ This reduced child maltreatment, with benefits extending over 15 years.²²

Given we found that maternal depression was associated with notifications for neglect and physical abuse, screening for psychiatric symptoms and early referral of at-risk mothers may be another effective strategy.²⁴ For instance, universal screening of pregnant women with the Edinburgh Postnatal Depression Scale²⁵ is already recommended in clinical guidelines from both the United States and Australia.^{26–28}

Reporting bias may be another explanation for the association

TABLE 3 Multinomial Logistic Regression Analyses of Variables Associated With Maltreatment in Both Siblings

Siblings With Notifications ^a	aOR	95% CI		Significance
		Lower Bound	Upper Bound	
One notification				
Female sex (first sibling)	0.38	0.17	0.82	.01
Female sex (second sibling)	0.94	0.46	1.94	.87
Difference in ages	1.72	0.71	4.17	.23
Racial origin	1.33	0.68	2.60	.41
Baseline age of mother	2.69	1.11	6.52	.03
Maternal education	1.86	0.53	6.52	.34
Living together	2.25	0.81	6.28	.12
Baseline recoded income	1.43	0.68	3.01	.35
Maternal depression at birth	0.33	0.04	2.84	.31
Two notifications				
Female sex (first sibling)	1.97	0.99	3.92	.05
Female sex (second sibling)	0.72	0.37	1.39	.33
Difference in ages	0.94	0.43	2.09	.89
Racial origin	1.69	1.03	2.79	.04
Baseline age of mother	2.65	1.19	5.90	.02
Maternal education	5.83	0.78	43.92	.09
Living together	1.25	0.44	3.52	.67
Baseline recoded income	1.32	0.67	2.60	.43
Maternal depression at birth	2.73	0.91	8.16	.07

^a The reference category is 0 notifications.

between agency-reported notifications and variables such as younger maternal age and indigenous status. For instance, it is possible that the threshold for informing statutory agencies is lower for potentially vulnerable groups. A notification in one child may also mean that caregivers are more alert to the same possibility in their siblings. Given that many of the environmental predictors of maltreatment are shared across family members, it is important to address these generic problems in addition to protecting the affected child.

There are several limitations to the study. The relatively low numbers of agency-notified and substantiated maltreatment meant that many of the results had wide CIs with lower ranges of almost 1. Self-reported maltreatment at 21 years old was restricted to sexual abuse, may not reflect the full extent of abuse, and was only provided by 68.1% of the sample. Although the questions were derived from studies in both the United States and Australia, they may have had lower specificity than an instrument such as the Child Trauma Questionnaire. This is why we have highlighted the agency-reported

results. However, the latter may also have limitations, such as underestimating the true prevalence of childhood maltreatment, given that rates are markedly lower than those reported by respondents in population-based surveys or notifications to statutory agencies in recent years.²⁹ Our figures may therefore reflect reporting practices of 20 to 30 years ago. This may also explain the 66% substantiation rate in notifications across both siblings (82 of 124), in that maltreatment had to be either obvious or severe for it to be reported. We were also only able to analyze by broad maltreatment type and could not investigate differences within categories. In addition, it is unclear if our results on siblings who were born within 3 years of each other are generalizable to those who are born further years apart. Finally, the design of the MUSP study meant that twins were excluded, and other work suggests that being a twin may be a risk factor for physical maltreatment in both siblings.⁸

CONCLUSIONS

Our results reveal that there is a high risk for child maltreatment in siblings of children with notified and/or substantiated abuse. They also reveal that a maternal age of <20 is the most consistent risk factor, with indigenous status, maternal depression, parental relationship, and familial poverty playing lesser roles. Greater awareness of these factors may inform interventions, particularly primary and secondary prevention.

TABLE 4 Associations Between Mother's Baseline Age and Notification Subtypes on 2 Siblings

	Age of Mother <20 y Old		
	aOR	95% CI	Significance
Notified physical abuse	3.51	1.14–10.8	0.03
Notified emotional abuse	4.91	1.49–16.1	0.01
Notified neglect	2.99	1.24–7.18	0.01
Notified sexual abuse	2.53	0.64–10.0	0.18
Notification by 5 y old	1.43	0.28–7.43	0.67
Any substantiated notification	3.58	1.38–9.26	0.01
Substantiated physical abuse	4.52	1.09–18.1	0.04
Substantiated emotional abuse	6.86	1.34–34.9	0.02
Substantiated neglect	3.59	1.00–12.8	0.05
Substantiated sexual abuse	2.18	0.37–12.8	0.39

ABBREVIATIONS

aOR: adjusted odds ratio
 CI: confidence interval
 MUSP: Mater-University of Queensland Study of Pregnancy
 RR: relative risk

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