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A meta-analysis of the prevalence of child sexual abuse disclosure in forensic settings

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ABSTRACT

Background: Identification, substantiation, prosecution, and treatment of child sexual abuse often rely heavily on a disclosure from the victim in the absence of corroborating evidence. For some, disclosure can be impeded by developmental or motivational barriers, thus compromising child safety and wellbeing. The literature on disclosure prevalence and mitigating influences does not yield a coherent picture. A more accurate estimate will help to inform investigation strategies to facilitate disclosure.

Objective: This study provides a meta-analysis of available research examining the prevalence of sexual abuse disclosure in forensic interviews with children under 18 years, and examines a range of factors that may influence the likelihood of disclosure.

Method: Databases were searched for published and unpublished studies up to May 2017. In total, 2393 abstracts were assessed for eligibility, 216 full-text articles were reviewed, and 45 samples (with 31,225 participants) provided estimates of effect sizes.

Results: The mean prevalence of child sexual abuse disclosure in forensic settings was 64.1% (95% CI: 60.0–68.1). Between-study variability was explained by: (1) child age and gender, with higher prevalence in older children and females; (2) prior disclosure, with higher prevalence when present; and (3) study year, with higher prevalence in more recent studies.

Conclusions: This meta-analysis confirms an upward trend in child sexual abuse disclosure prevalence. However, more than a third of children do not disclose when interviewed, with those who are younger, male, and without a prior disclosure at greatest risk. Important implications for forensic interviewing protocols and future research are discussed.

1. Introduction

Child sexual abuse (CSA) is a global problem with far-reaching consequences. While North American incidence studies suggest a steady downward trend (Fallon et al., 2015; Finkelhor, Saito, & Jones, 2015), international CSA prevalence remains high at nearly 12% (Stoltenborgh, van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011). The adverse sequelae of CSA can span physical, emotional, cognitive, behavioral, social, and neurobiological domains across the life course (Dube et al., 2005; Hillberg, Hamilton-

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Giachritsis, & Dixon, 2011). Effectively protecting children from recurring abuse and treating the resulting trauma often hinge on a disclosure statement given that, even in acute cases, the presence of physical evidence is exceedingly rare (Smith, Raman, Madigan, Waldman, & Shouldice, 2018). The purposeful disclosure of sexual abuse by some victims, however, can be obstructed by developmental, socioemotional, interpersonal, and contextual barriers, the potential consequences of which can jeopardize children's safety and wellbeing. With important implications for criminal and child protection investigations, the current study will provide a comprehensive meta-analysis of existing literature by examining the prevalence of CSA disclosure in the context of forensic interviews with children, and determining the extent to which a range of sample- and study-level variables moderate prevalence.

Sexual abuse and disclosure patterns have garnered extensive attention in theoretical, clinical, and empirical literatures. The quantitative study of CSA, however, has been fraught with challenges, both conceptual and methodological (Collin-Vézina, Daigneault, & Hébert, 2013; Fallon et al., 2010). The dynamics of CSA, often shaped by sophisticated perpetrator grooming tactics and broader societal denial of the scope of the problem, tend to foster shame, stigma, and fear that can silence victims and their families, making accurate estimates difficult to glean. Most investigations into the prevalence and predictors of abuse disclosure rely on either retrospective self-report surveys of adolescent or adult populations, or case reviews of child statements during clinical or forensic evaluations, with or without external confirmation of abuse. Both research designs come with a number of shortcomings that may contribute to erroneous reporting and skewed data (London, Bruck, Ceci, & Shuman, 2005; Lyon, 2007). Much of this body of literature is flawed in its application of ambiguous and inconsistent operational definitions of what constitutes sexual abuse and disclosure of sexual abuse, reliance on small or selective samples, biased data collection methods, and weak control of extraneous variables, therefore precluding generalizable findings.

Notwithstanding these limitations, there is compelling evidence to suggest that nondisclosure and delayed disclosure of sexual abuse are indeed widespread in childhood. One Canadian study found that more than three-quarters of a representative sample of adults reported either never disclosing or delaying their disclosure of CSA by more than five years from the first incident (Hébert, Tourigny, Cyr, McDuff, & Joly, 2009). In their review of retrospective research data, London et al. (2005) concluded that only one-third of adults who experienced CSA disclosed during childhood, and less than one-fifth of cases came to the attention of authorities. Of the minority of cases that get reported to law enforcement or child protection services (CPS), the likelihood of disclosure by children during formal investigation tends to be significantly higher than disclosure amongst the general population, since most present with suspicion of abuse at the outset based on prior disclosure or other corroborative indicators.

Although it is estimated that approximately two-thirds of suspected victims disclose their abuse when questioned with a structured investigative interview protocol (Hershkowitz, Horowitz, & Lamb, 2005; Lamb, Orbach, Hershkowitz, Esplin, & Horowitz, 2007), the rates of CSA disclosure in forensic settings are considerably discrepant across studies. This is due, in part, to variability in research design, sample characteristics, and interview method, therefore highlighting the importance of meta-analyses of conflicting findings to establish accurate estimates with greater statistical power. It should be noted at the outset that, in addition to the general research limitations cited above, the interpretation of extant research can be challenging as ground truth is seldom known; that is, it is rarely known with absolute certainty whether the children in any given sample have or have not experienced abuse. Thus, neither disclosures nor denials of CSA in an investigative context are inherently credible. Noncredible disclosures, or false positives, can result from prior undue influence by a third party with ulterior motives or improper questioning strategies. False allegations of CSA, however, occur at non-negligible rates in the range of two to five percent (O'Donohue, Cummings, & Willis, 2018). Far more common are noncredible nondisclosures, or false negatives, due to developmental or motivational impediments, which can persist even when independent conclusive evidence of abuse exists. When controlling for false positives and minimizing the effects of suspicion and substantiation bias, reviews of the literature have found that more than half of confirmed child victims failed to disclose abuse when formally interviewed (Lyon, 2007; Olafson & Lederman, 2006). These findings suggest that, for some children, there are persuasive barriers to telling, even when asked.

2. Potential moderators of child sexual abuse disclosure

Disclosure of CSA has been conceptualized as an ongoing multifaceted process influenced by a spectrum of intrapersonal, interpersonal, and contextual factors that intersect across the lifespan and ecosystem (Alaggia, Collin-Vézina, & Lateef, 2017; Collin-Vézina, Sablonni, Palmer, & Milne, 2015; Lemaigre, Taylor, & Gittoes, 2017). Research into the variables promoting or inhibiting purposeful CSA disclosure has generated inconsistent findings, though some trends have emerged. To date, the most frequently and reliably measured predictors of disclosure in forensic settings appear to be child age and gender, and to a lesser extent, child ethnicity, child-perpetrator relationship, abuse severity, prior disclosure, and interview method. In relation to their impact on disclosure prevalence in a forensic context, each factor is sufficiently variable across studies, and thus, important to investigate meta-analytically to determine which variables explain between-study variability in the current body of research.

2.1. Child age

While some studies report no significant association between CSA disclosure and age (Bradley & Wood, 1996; DeVoe & Faller, 1999), children of younger age, both at the time of abuse and time of interview, have been observed to be less likely to intentionally disclose (Azzopardi, Madigan, & Kirkland-Burke, 2014; Lippert, Cross, Jones, & Walsh, 2009; Pipe et al., 2007) and to provide less detailed accounts (Lamb et al., 2003) than older children. Younger children's failure to disclose when questioned may be attributed, at least in part, to their limited understanding of sociosexual taboos, lack of perceived salience and memory encoding of abusive episodes, and less developed cognitive and communicative capacities. In contrast, other studies have found higher rates of

nondisclosure or delayed disclosure among older children (Bybee & Mowbray, 1993; Hershkowitz, Lanes, & Lamb, 2007). Theoretically speaking, this finding might be explained by the deterring effect of older children's advanced social awareness of the negative consequences of telling or cognitive appraisals of self-blame and shame. Either way, these findings suggest variability in the patterning of findings, underscoring that developmental stage of the victim is an important factor to examine to identify sources of between-study variability in the literature amassed to date.

2.2. Child gender

While girls are more than twice as likely as boys to be sexually abused (Stoltenborgh et al., 2011), males have been shown to disclose at lesser frequencies than their female counterparts (DeVoe & Faller, 1999; Hershkowitz, 2006; Lippert et al., 2009). This may be partially due to dominant gender-based socialization, heightened risk of stigmatization and shame, and differences in help-seeking behavior among boys. Other studies, however, have reported no significant gender differences in rates of CSA disclosure in interviews (Azzopardi et al., 2014; Goodman-Brown, Edelstein, Goodman, Jones, & Gordon, 2003).

2.3. Child ethnicity

Cultural norms and language can shape how CSA is understood and talked about. The influence of a child's ethnoracial identity on abuse disclosure in forensic interviews has received attention in the literature (Fontes & Plummer, 2010). While some researchers have shown that ethnicity can impact disclosure (Bailey, Powell, & Brubacher, 2017; Elliott & Briere, 1994; Springman, Wherry, & Notaro, 2006), others suggest no significant cross-cultural differences in disclosure rates (Lawson & Chaffin, 1992).

2.4. Child-perpetrator relationship

Against a complex backdrop of family loyalty, attachment and traumatic bonding, power dynamics and dependency, and fear of repercussions, it seems logical that relational closeness between victims and perpetrators would contribute to the delay or withholding of CSA disclosure. Several empirical studies have confirmed a negative association between more familiar child-perpetrator (i.e., familial) relationships and decreased likelihood to allege abuse in a forensic context (Hershkowitz, Lamb, & Horowitz, 2007; Pipe et al., 2007; Stroud, Martens, & Barker, 2000), whereas others have demonstrated no meaningful association between the nature of the relationship and disclosure (Azzopardi et al., 2014).

2.5. Abuse severity

Sexual abuse severity has been defined differently across disclosure studies (e.g., contact vs. noncontact abuse, penetration vs. fondling, single incident vs. chronic, coercive vs. noncoercive, physically violent vs. nonviolent), posing challenges in the interpretation and comparison of data. For example, when narrowly conceptualized, penetration as an indicator of more severe abuse has been inconsistently shown to increase (Hershkowitz, 2006), decrease (Goodman-Brown et al., 2003), or have no effect (Sjöberg & Lindblad, 2002) on the likelihood of disclosure. While it is plausible that victims who experience more severe abuse would be more apt to disclose because of resulting physical injuries, sexually transmitted infections, or pregnancy requiring medical intervention (the help-seeking process therefore preventing the deliberate avoidance of disclosure), less severe abuse might harvest less shame and therefore, increase the probability of disclosure.

2.6. Prior disclosure

Most alleged victims who undergo formal investigation for sexual abuse have disclosed their abuse to someone (e.g., parent, teacher, therapist) prior to the forensic interview. It is therefore purported that these children are more ready, willing, and able to talk about their experiences of abuse. Prior disclosure has indeed been shown to increase the likelihood of disclosure when questioned in a forensic setting (Bailey et al., 2017; Keary & Fitzpatrick, 1994; Lippert et al., 2009). Thus, the degree of prior disclosure in any given study may account for variation across study findings.

2.7. Interview method

Early child abuse investigative interviewing practices were challenged for using developmentally inappropriate, leading, or suggestive questioning strategies to elicit disclosures from alleged victims, which sometimes resulted in false positives, reduced credibility, and emotional distress (Faller, 2015). Best practice guidelines and standardized evidence-informed protocols have since been established to promote legally defensible, emotionally supportive, developmentally sensitive, and less biased interviewing. Among the most widely recognized and robustly evaluated structured approaches to investigative interviewing is the National Institute of Child Health and Human Development (NICHD) protocol, which, when utilized as intended, has been shown to reduce the use of suggestive and option-posing prompts, and elicit more allegations and forensically relevant details (Hershkowitz, Lamb, & Katz, 2014; Lamb et al., 2007). Its performance, however, has been inconsistent across age groups and among reluctant disclosers (Benia, Hauck-Filho, Dillenburg, & Stein, 2015; Hershkowitz, 2006). Other structured and semi-structured interviewing protocols include the National Children's Advocacy Center's (NCAC) interview, CornerHouse's RATIC (Rapport, Anatomy identification, Touch

inquiry, Abuse Scenario, Closure) protocol, RADAR (Recognizing Abuse Disclosure types and Responding), Child Interview Guide, Ten Step, and Step-wise, among others. As approaches to information gathering have evolved considerably over time and have varying degrees of empirical support for their efficacy, interview method is important to consider as a potential moderator of disclosure prevalence.

3. Study objectives

Taken together, the CSA literature paints a confusing picture of the factors that influence children's willingness or capacity to allege abuse in forensic interviews. When findings across studies conflict, it becomes difficult to interpret the composite of results. This proves especially problematic when attempting to use scientific databases to develop the most relevant and targeted investigation protocols. By combining studies via a meta-analysis, the shortcomings of individual, and often discrepant, studies can be overcome. Thus, a systematic synthesis of this research will help to disentangle the variations among prevalence of CSA disclosure and can address potential moderating factors that may increase or decrease rates of disclosure. As there is considerable variability in CSA disclosure within the context of child forensic interviewing, we concentrated our analyses on this body of research. The additional variability inherent in studies assessing the prevalence of CSA disclosure in retrospective adult studies, and the associated problems that arise for sound analyses, were therefore avoided.

The main objectives of the current study, then, were to help resolve discrepancies and debates in the field of child maltreatment by synthesizing published and unpublished studies in order to provide an overall prevalence rate of CSA disclosure in forensic settings through meta-analysis, and to identify moderating variables that may amplify or attenuate disclosure likelihood. More specifically, we investigated whether disclosure prevalence varied as a function of: (1) demographic and abuse-related characteristics, including child age, gender, ethnicity, abuse severity, prior disclosure, and child-perpetrator relationship; (2) methodological characteristics, including whether CSA was defined and whether a recognized interview protocol was used; and (3) study-level characteristics that may create between-study variability, including dissemination method (published versus unpublished), study year, and geographical location.

4. Method

4.1. Definitional criteria

For the purpose of the current meta-analysis, *child sexual abuse* was defined as any unwanted, nonconsensual, or exploitative sexual activity involving a child under 18 years of age, including contact abuse (e.g., kissing; touching of breasts, genitals, or anus; vaginal, anal, or oral penetration) and noncontact abuse (e.g., exhibitionism; use in, or exposure to pornography; observing masturbation or other sex acts). *Disclosure* was conceptualized as a child's verbal or written statement alleging an experience of sexual abuse during a formal interview. Interviews were considered *forensic* when they were conducted by a professional for the primary purpose of eliciting evidentiary information from a child regarding suspected abuse in the context of a child protection and/or criminal investigation or assessment. Interviews conducted by health or mental health professionals were considered forensic if they served a primarily forensic, or dual forensic and clinical purpose. *Interview method* was defined as the type of approach used for forensic information gathering (i.e., whether a recognized protocol was used). A protocol was considered recognized when it followed structured or semi-structured operational guidelines informing the stages or phases of the interview(s), designed specifically to enable children to provide accurate and reliable accounts of events they may have experienced for evidentiary purposes. Additional moderators are defined in [Table 1](#).

4.2. Search strategy

This meta-analysis was based on recommendations and standards set by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; [Moher, Liberati, Tetzlaff, & Altman, 2009](#)). Searches were conducted by a medical librarian in PsycINFO, EMBASE, MEDLINE, Social Work Abstracts, and the Cochrane Central Register of Controlled Trials for published and unpublished studies up to May 2017. Database specific subject headings were selected for the concepts of "sexual abuse" and "disclosure" (see [Appendix A](#) for detailed search strategy). All abuse and disclosure terms were respectively combined with the Boolean "OR." These two sets of terms were then combined with the Boolean "AND." In all databases, adjacency operators and truncation symbols were used in text word searches, when appropriate, to capture variant endings of the search terms and variant spellings.

4.3. Inclusion criteria

To identify studies meeting inclusion criteria, titles and abstracts identified in the search strategy were reviewed. When titles and abstracts were insufficient to determine inclusion criteria, full articles were retrieved. The full text of all relevant studies were reassessed for inclusion and subsequently included or excluded as appropriate. As a further search method, reference lists of relevant articles were scanned for inclusion of additional studies. Studies were included if they met each of the following criteria: (1) the study sample consisted of children under 18 years of age; (2) the study reported the prevalence of CSA disclosure, with the provision of both sample size and prevalence rates; (3) CSA was assessed in the context of an interview with a forensic purpose; and (4) the study was available in English. In cases where a study had multiple publications of the same dataset, the study with the largest sample size and

Table 1
Data Extraction Coding Schedule for Study Variables.

Variable	Coding	Description
<i>Study Characteristics</i>		
Study year		Continuous
Dissemination type	0 Dissertation 1 Chapter 2 Journal article	
<i>Sample Characteristics</i>		
Ethnic minority		Continuous (%)
Male child		Continuous (%)
Child age		Continuous (mean)
Geography	0 North America 1 Europe 2 South America 3 Australia 4 Asia 5 Africa 6 Middle East	Including New Zealand
<i>Perpetrator Characteristics</i>		
Intrafamilial abuser		Continuous (%)
Abuse by extrafamilial acquaintance/friend		Continuous (%)
Abuse by stranger		Continuous (%)
<i>Abuse Characteristics</i>		
Abuse severity		Continuous (%); penetration occurred
Prior disclosure		Continuous (%); previously disclosed abuse in nonforensic context
<i>Study Procedures</i>		
Interview method	0 NICHD 1 NCAC 2 RATA 3 RADAR 4 Child Interview Guide 5 Other recognized 6 Not recognized/indicated	E.g.) Step-wise, Ten Step, ChildFirst
Disclosure defined	0 Yes 1 No	

most comprehensive data for moderator analyses was included so as to avoid including overlapping samples in the meta-analysis.

4.4. Data extraction

Studies meeting inclusion criteria were coded using a standard data extraction form (see Table 1) developed to rate each study on measurement characteristics, as well as study-level and sample-level moderators, including child age, gender, ethnicity, child-perpetrator relationship, abuse severity, prior disclosure, disclosure definition, interview method, dissemination type, study year, and geographical location. In studies where both ‘full’ and ‘partial’ disclosure rates were reported, full disclosure rates were extracted. To ensure accuracy and reliability, all studies were double-coded by a second coder, and any discrepancies were resolved through conferencing.

4.5. Data analysis

All data extracted were analyzed in Comprehensive Meta-Analysis (CMA, 3.0). CMA transforms the prevalence into a logit event rate effect size with a computed standard error. Subsequently, effect sizes are weighted by the inverse of their variance, giving greater weight to studies with larger sample sizes and thus, more precise estimates. Finally, logits are retransformed into proportions to facilitate ease of interpretation. Additionally, 95% confidence intervals (CI) around the mean point estimate are provided. Random effect models, a more conservative estimate of the mean prevalence, were selected to calculate effect sizes. Random effect models assume that random differences exist in study settings and methods of data collection, including study- and subject-level sampling error (Lipsey & Wilson, 2001). This choice of method is consistent with the suggestion that variability across studies examining elements of child maltreatment and exposure may be the result of common differences in methodological approaches and operational definitions utilized in this area of research (Finkelhor, 1994; Pereda, Guilera, Forns, & Gómez-Benito, 2009).

To assess for heterogeneity of effect sizes, the Q and I^2 statistics were computed. Moderators were examined using the Q statistic (categorical moderators) and meta-regression (continuous moderators) to account for potential heterogeneity of effect sizes (Borenstein, Hedges, Higgins, & Rothstein, 2011; Thompson & Higgins, 2002). Publication bias was assessed using Egger’s test and inspection of funnel plots (Egger, Smith, Schneider, & Minder, 1997).

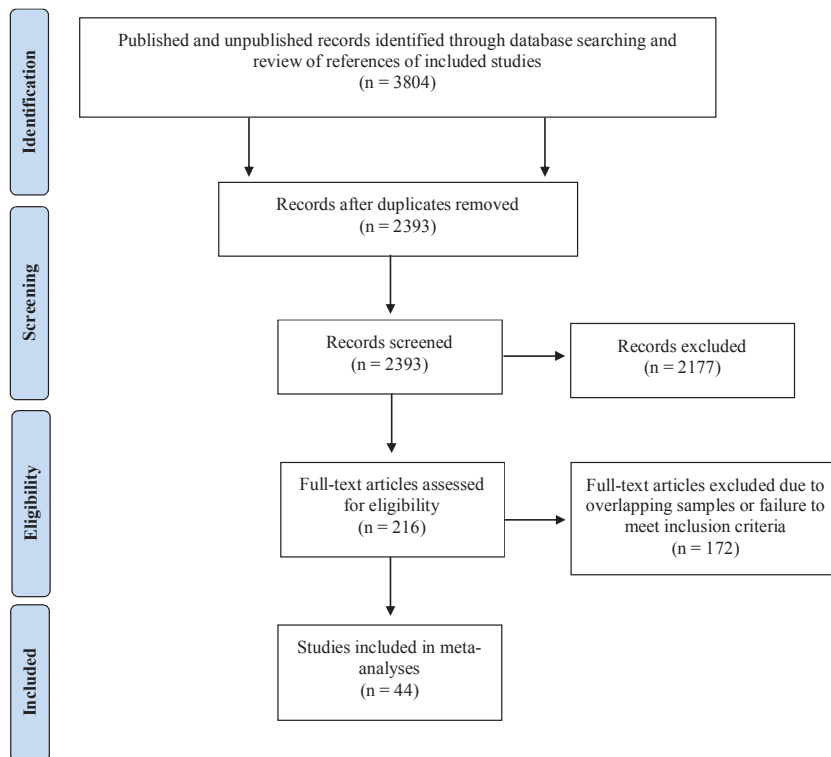


Fig. 1. PRISMA flow used to identify studies for detailed analysis of the prevalence of child sexual abuse disclosure in forensic interviews.

5. Results

As detailed in the PRISMA statement in Fig. 1, our electronic search yielded 2393 nonduplicate articles. Upon review of the titles and abstracts, 216 articles were identified as potentially meeting study inclusion criteria and full articles were retrieved. A total of 44 studies with 45 independent samples (31,225 participants) met full inclusion criteria.

5.1. Study characteristics

Study characteristics are reported in Table 2. Included studies were published between 1989 and 2017, with sample sizes ranging from 18 to 15,753 ($M = 694$; $SD = 2355$). Most (80%) of the studies were from North America; however, 59% ($n = 18,359$) of the full sample was represented from 3 studies conducted in Israel. Across studies, the mean age of children ranged from 3.9 to 11.8 years ($M = 8.1$), and 72.1% were female. Of studies specifying ethnicity ($k = 29$), just under half (43%) of the children were from a minority background. The use of a recognized interview protocol was reported in just over a third (34%) of the studies, with the NICHD protocol most commonly used.

5.2. Meta-Analysis

The combined prevalence of CSA disclosure in the context of a forensic interview was 64.1% ($k = 45$; $CI: 60.0–68.1$; see Fig. 2). Thus, nearly two-thirds of children disclosed sexual abuse when questioned in a forensic setting, while more than one-third did not. No publication bias was detected (see Fig. 3). Significant between-study differences were detected ($Q = 541.93$; $p < .0001$; $I^2 = 99.0$) and potential moderating variables were explored. All moderator analyses are reported in Table 3, and significant moderators are discussed in detail below.

Child age and gender emerged as significant moderators. Specifically, the prevalence of CSA disclosure in forensic interviews increased as children aged ($k = 44$; $b = .04$; $p < .001$) and as the percent of females in studies increased ($k = 44$; $b = 0.004$; $p < .05$). Prior disclosure was also a significant moderator, with the likelihood of CSA disclosure during interview(s) increasing when a prior disclosure had occurred ($k = 24$; $b = 0.003$; $p < .04$). An examination of study year as a moderator suggested that the prevalence of CSA disclosure has significantly increased over time ($k = 45$; $b = 0.008$; $p < 0.001$).

6. Discussion

This study, to our knowledge, represents the first meta-analysis of research amassed to date examining the prevalence of sexual

Table 2
 Characteristics of Studies Included in the Meta-Analysis of Child Sexual Abuse Disclosure Prevalence in Forensic Interviews.

Study	N ^a	Female (%)	Child Age (Years)	Recognized Interview Protocol	Prior Disclosure (%)
Alonzo-Proulx and Cyr (2016)	139	69	8.95	Yes	–
Alonzo-Proulx and Cyr (2016) ^b	106	69	8.98	No	–
Azzopardi et al. (2014)	47	61.7	6.1	Yes	–
Bailey et al. (2017)	1183	83.8	11.77	No	73.4
Bolen et al. (2002)	183	79	–	No	99.5
Bradley and Wood (1996)	234	82	10	No	72
Brink et al. (2015)	1422	69.5	8.2	No	83.8
Bybee and Mowbray (1993)	106	51.9	5.62	No	83
Cantlon et al. (1996)	1535	70	6.9	No	–
Carnes et al. (2001)	137	68.7	6.26	Yes	–
Cheung (2008)	90	67.8	7.53	No	–
DeVoe and Faller (1999)	76	61.8	6.8	Yes	73.7
Dubowitz et al. (1992)	99	83	6	No	–
Elliott and Briere (1994)	399	78.4	11.03	No	92.7
Gomes et al. (2014)	215	82.3	7.9	No	52.6
Gordon and Jaudes (1996)	141	89	6.4	No	–
Gries et al. (1996)	96	49	8.3	No	44.8
Gudjonsson et al. (2010)	285	85	11.3	Yes	62
Haidar (2005)	51	43.1	7	No	–
Haskett et al. (1995)	175	80.6	7.9	No	–
Hayden (2015)	100	64	5.9	Yes	51
Hershkowitz et al. (2007)	15771	69	9.8	Yes	–
Hershkowitz et al. (2014)	18	45.5	8.08	Yes	34
Hlavka (2008)	100	50	9.91	No	74
Keary and Fitzpatrick (1994)	251	66	8.23	Yes	49
Koverola et al. (1993)	39	100	8.83	No	–
Krause-Parello and Gulick (2015)	42	95.2	8.92	No	–
Lawson and Chaffin (1992)	28	100	7.2	No	0
Leach et al. (2017)	466	81.2	10.93	Yes	90.7
Leventhal et al. (1989)	83	78	3.9	No	–
Levy et al. (1995)	104	71	5	No	–
Lippert et al. (2009)	987	81	9.91	No	62
Melkman et al. (2017)	2570	67	9.97	No	–
Mok (1996)	452	71	8.8	Yes	76
Pipe et al. (2007)	294	65.9	8.11	Yes	81.3
Rush et al. (2014)	28	68	5.75	No	67
Schaeffer et al. (2011)	327	68.2	8.9	Yes	89.9
Springman et al. (2006)	220	76.8	9.43	No	95.9
Sternberg et al. (2001)	86	73	8.1	Yes	–
Stroud et al. (2000)	1043	74	8.4	No	–
Teoh et al. (2014)	231	70.8	8.01	Yes	100
Walsh et al. (2010)	1120	80.2	9.7	No	–
Wang et al. (2016)	55	87.3	6.7	No	91
Welbourne (2002)	36	75	9	No	64
Wood et al. (1996)	55	69.1	5.7	Yes	–

Notes. ^a N used in analyses. ^b Duplicate due to two samples within single study using different interview methods. – = data not provided in individual study.

abuse disclosure among children in a forensic context, and potential moderators of the prevalence of disclosing. Our synthesis of 45 independent samples with a total of 31,225 participants showed that 64.1%, or nearly two-thirds, of alleged child victims disclose sexual abuse when formally interviewed. This finding is consistent with the 64% disclosure rate reported by London et al. (2005) in their literature review of studies investigating children interviewed by CPS or other professionals for suspected CSA, and comparable to the two-thirds disclosure rate reported in reviews of NICHD protocol research (Lamb et al., 2007). Disclosure and nondisclosure rates in this study include both credible and noncredible accounts. The absence of disclosure may therefore be a sound indication of no abuse in a minority of cases. As expected, there was considerable conceptual and methodological heterogeneity across studies, and several moderator variables emerged to explain between-study variability. Of the sample-level and study-level variables tested for their moderating effect on disclosure prevalence, child age and gender, prior disclosure of sexual abuse, and study date were significant. These findings, each discussed in turn below, bring to light several important implications for forensic interviewing practices and protocols, particularly with the subset of children at greatest risk for nondisclosure of valid abuse allegations.

Age significantly moderated the prevalence of CSA disclosure in this meta-analysis. Specifically, it was observed that disclosure in forensic settings increased as children aged. Assuming allegations are valid, some young children, especially those who are preschool aged, may be less inclined to purposefully talk about their abuse because of their limited sexual knowledge and lack of awareness or understanding that they were victimized. In other words, they may not have the capacity to realize the sexual nature of their

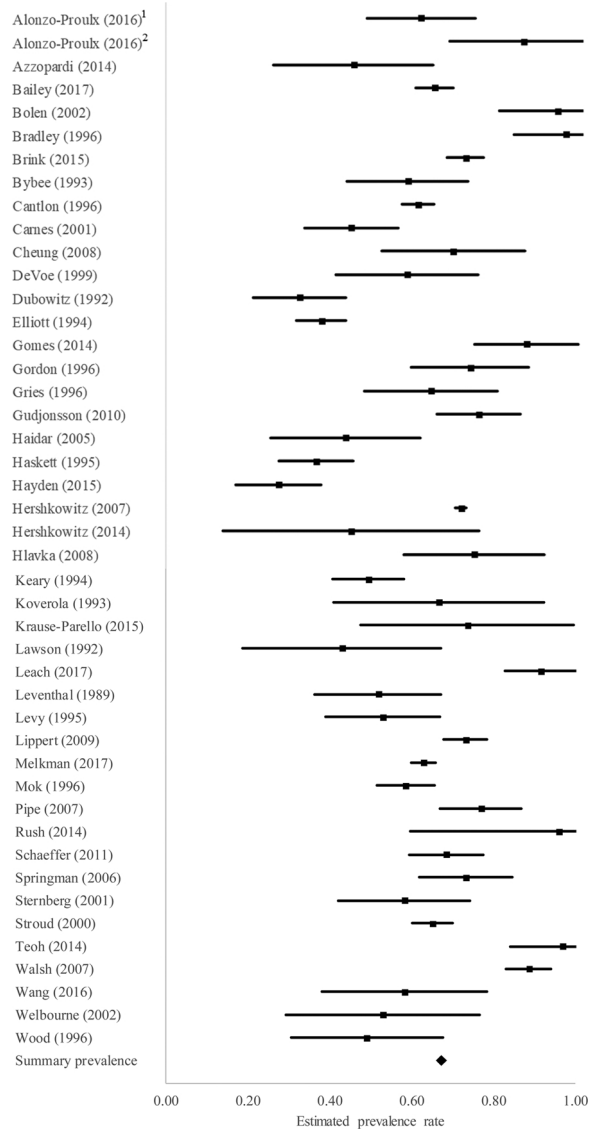


Fig. 2. Forest plot of the effect sizes for each study included in the meta-analysis of child sexual abuse disclosure prevalence in forensic interviews. *Note.* Observed effect sizes and 95% CIs are indicated for each sample. The overall prevalence estimate was 64.1% (95% CI: 60.0–68.1).

experiences, the criminal element, or the social stigma attached to the use of children by adults for sexual purposes. Moreover, their shorter attention spans and less advanced language and memory encoding and retrieval skills may restrict their ability to provide clear, consistent, and sufficiently detailed disclosure statements that meet the threshold for substantiation and prosecution. That being said, many young children do, in fact, possess the capacity to accurately and reliably recall experienced events with proper interviewing strategies (Hershkowitz, Lamb, Orbach, Katz, & Horowitz, 2012; Lamb et al., 2003). This highlights the importance of implementing developmentally-sensitive questioning techniques in investigative interviews that may facilitate disclosure among younger children. Saywitz, Lyon, and Goodman (2018) suggest that using a ‘one size fits all’ interview approach with three- to five-year-olds may not be as productive as adopting a more flexible science-based ‘tool-box’ approach. Strategies with the potential to mitigate obstacles associated with developmental stage include the use of open-ended prompts and cued invitations to encourage free recall and guard against suggestibility (Hershkowitz et al., 2012; Lamb et al., 2007), and the provision of multiple interviews to increase opportunities to tell (Faller, Cordisco-Steele, & Nelson-Gardell, 2010; Hershkowitz & Terner, 2007).

Child gender also emerged as a significant predictor of CSA disclosure prevalence in this meta-analysis, with females being more likely to disclose abuse when interviewed than males. Higher rates of nondisclosure among males are conceivably a function of gender-based socialization and dominant cultural prescriptions of masculinity that minimize their experience (Alaggia & Millington, 2008; Gagnier & Collin-Vézina, 2016). While shame and stigma can operate as powerful deterrents to disclosure among all sexual abuse victims, boys may be especially influenced by societal stereotypes that characterize help-seeking and vulnerability in males as

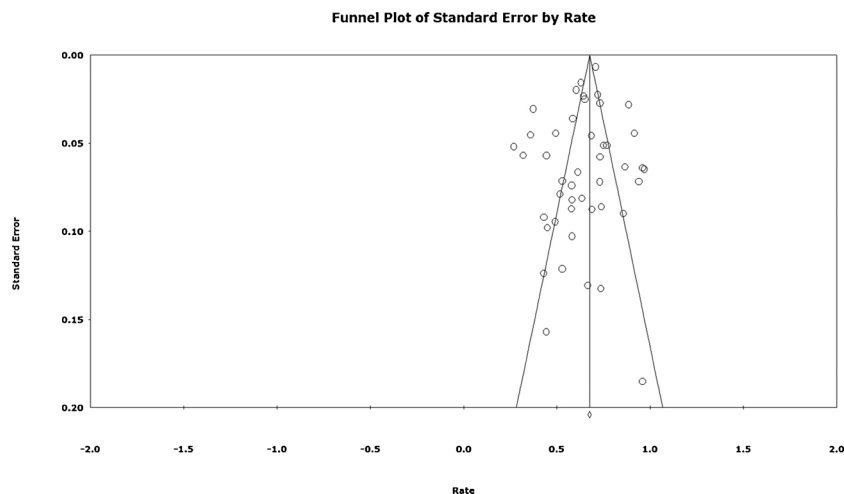


Fig. 3. Funnel plot of the studies examining the prevalence of child sexual abuse disclosure in forensic interviews.

Note. The funnel plot is a measure of study size (y-axis) as a function of effect size (x axis). Observed studies are indicated by circles. The middle vertical line is the mean prevalence estimate, and the contour lines (to its left and right) represent the region within which 95% of observed studies should lie in the absence of publication bias. Studies with large sample sizes appear toward the top of the graph, and tend to cluster near the mean effect size, whereas studies with smaller sample sizes appear to the bottom-middle right of the graph. Due to the tendency to have more sampling variation in effect size estimates in studies with smaller sample sizes, these studies will be dispersed across a range of values (bottom-middle right of plot). In this meta-analysis, there was no evidence of publication bias.

Table 3

Results of Moderator Analyses of Child Sexual Abuse Disclosure Prevalence in Forensic Interviews.

Categorical Moderators	<i>k</i>	Prevalence Estimate (%)	95% CI	Homogeneity <i>Q</i>	<i>p</i> -value
<i>Publication Status</i>	41	65.5*	61.4-69.6	2.16	.15
Published	4	50.0*	30.5-70.2		
Unpublished					
<i>Study Location</i>	35	63.1*	57.2-69.0	0.34	.84
North America	4	66.6*	47.8-85.3		
Europe	3	65.7*	58.0-73.5		
Middle East					
<i>Recognized Interview</i>	30	64.9*	59.6-70.2	0.30	.58
No	15	62.2*	53.9-70.5		
Yes					
<i>Disclosure Defined</i>	30	66.4*	62.0-70.8	1.63	.20
No	15	59.5*	49.7-69.2		
Yes					
Continuous Moderators	<i>k</i>	<i>b</i>	95% CI	<i>Z</i> -value	<i>p</i> -value
Ethnic minority	29	-.000	-.002-.002	-0.15	.88
Percent female	44	.004	.008-.001	2.03	.05
Age at interview	44	.041	.019-.063	3.68	.001
Intrafamilial perpetrator	25	.001	-.003-.004	0.12	.91
Prior disclosure	24	.003	.000-.006	2.08	.04
Abuse severity	31	.002	-.004-.000	-1.62	.11
Study year	45	.008	.003-.012	3.46	.001

Notes. **p* < 0.001; *k* = number of samples.

signs of weakness, or a generalized fear of being erroneously labelled as gay given that most perpetrators are male. Conceptualizing CSA disclosure as a gendered phenomenon gives rise to targeted techniques in forensic interviews with boys that are considerate of potential psychosocial sequelae rooted in masculine norms. While little is known about the decision-making process children engage in to determine who to trust with their story, there is consensus that rapport between the interviewer and child is paramount for a productive forensic interview. Interviewer behavior and protocols that promote rapport building and noncontingent support may effectively reduce reluctance and increase accurate reports of abuse by fostering engagement, trust, and cooperation (Hershkowitz, Orbach, Lamb, Sternberg, & Horowitz, 2006, 2014; Saywitz, Wells, Larson, & Hobbs, 2016).

In this meta-analysis, prior disclosure of CSA was also shown to significantly moderate the prevalence of disclosure in a forensic context, with findings suggesting that children who tell someone about their abuse before being interviewed are more likely to tell again when interviewed. Those without a prior disclosure may come to the attention of authorities due to medical findings, material

evidence, eyewitness testimony, sexualized behaviors, trauma symptoms, or other grounds for suspicion independent of disclosure. These alleged victims may not be ready to talk about their experiences due to fear, anxiety, or other socioemotional barriers. Thorough forensic interview planning and preparation should be prioritized to enhance their sense of safety and wellbeing. When selecting the most appropriate interviewer and interview setting, effort should be placed on proactively identifying who the child would be most comfortable speaking with (e.g., forensic interviewer versus law enforcement officer) and where they would feel safest (e.g., Child Advocacy Center versus police station). Such decisions should take into account relationship history, developmental stage, and psychological welfare.

Like those proposed above to alleviate age- and gender-specific barriers, additional strategies to promote disclosure among reluctant children include multiple interviews or extended evaluation, opportunities for nonverbal forms of disclosure, enhanced rapport building, and noncontingent interviewer support. Empirical evaluation of the revised NICHHD protocol has demonstrated the effectiveness of supportive forensic interviewing with young victims who may be unwilling to make allegations (Hershkowitz et al., 2014). Moreover, best practice interviewing recommends the use of ground rules to ensure children have adequate expectations about the interview process (Dickinson, Brubacher, & Poole, 2015). Proper delivery of ground rules mitigates children's misconceptions about the interview process and safeguards against any concerns they may have about talking about abuse events (Cordon, Saetermoe, & Goodman, 2005). This could be especially impactful for those who have not yet disclosed and have no prior knowledge of what the experience of disclosure will be. Exploring motivations to suppress disclosure in a nonsuggestive manner could also unearth the self-protective function of silence and alleviate pressure.

Interestingly, study date emerged as another significant moderator of CSA disclosure prevalence in this meta-analysis. This finding suggests that the likelihood of suspected victims alleging abuse in forensic interviews has gradually increased over the course of time. While the credibility of allegations cannot be verified, this rising trend in disclosure patterns may signal positive change, in that children appear to be less averse to reporting their abuse when asked. Coinciding with the overall decline of CSA (Finkelhor et al., 2015), increasing rates of disclosure may be partially due to effective CSA education and prevention campaigns aimed at raising awareness and diminishing the stigma surrounding abuse. This may also be a function of higher quality investigative interviewing protocols designed to promote valid disclosures and thus, reduce false denials.

The prevalence of CSA disclosure was not moderated by the use of a recognized interview protocol. While distinct approaches to forensic interviewing range in degree of structure, questioning technique, and stage sequencing, most share common goals, principles, and phases. It is plausible that, regardless of whether a recognized protocol was indicated, studies adhered to comparable interviewing methods, therefore not contributing significantly to disclosure variance. Moreover, most forensic interview protocols and guidelines have not been extensively empirically and psychometrically evaluated (Cirlugea & O'Donohue, 2016), with the exception of the NICHHD protocol. Limited efficacy research and weak control of protocol compliance within existing efficacy research challenge our ability to reliably interpret rates of disclosure across various interview protocols. Nevertheless, investigative interviewers should follow standardized protocols supported with the best available scientific evidence to ensure that all potential victims are provided with a fair opportunity to report their experiences accurately and completely, underscoring the importance of quality training, supervision, and peer review.

6.1. Limitations and future research directions

This meta-analysis expands our knowledge of the CSA disclosure process and offers valuable information for forensic interviewers and researchers concerned with disclosure, as well as factors that increase or decrease prevalence of CSA disclosure. Findings, however, should be interpreted in the context of several limitations. The strength of any meta-analysis is dependent on the quality of information provided in individual study methodology (Madigan, Wade, Tarabulsky, Jenkins, & Shouldice, 2014). Empirical comparisons are complicated by variations in research design, sample characteristics, and unclear or inconsistent operational definitions of abuse, disclosure, and various moderator constructs. Greater transparency in study methodology is sorely needed in CSA disclosure literature and would offer stronger assurance of the precision of effect size estimates.

Ground truth is rarely known in cases of suspected CSA, and disclosure studies tend to inconsistently report investigation components and outcomes. A number of important factors were therefore indiscernible in this study, including whether disclosures and nondisclosures were credible or noncredible, whether disclosure statements were deemed full or partial, whether the forensic interview was the initial interview or a subsequent/repeated interview, whether the clinical elements of interviews with a dual forensic and clinical purpose compromised forensic soundness, and whether allegations were substantiated or unsubstantiated by authorities.

Although we reported on the moderators most commonly examined in CSA disclosure research, we were unable to include other important variables in our analyses due to an insufficient number of studies investigating these associations. Among the most potentially meaningful moderating influences requiring further study is nonoffending caregiver response, given the purported power of anticipated social reactions. There is some data to suggest that caregiver support increases the likelihood of abuse disclosure among children (Azzopardi et al., 2014; Lawson & Chaffin, 1992; Lippert et al., 2009); however, the small number of studies ($k = 7$; 16% of all included studies) available for this meta-analysis restricted our ability to draw conclusions. Caregiver response is therefore a critical avenue for future research to determine its robustness in predicting CSA disclosure in forensic interviews.

Another important area for future inquiry emerging from this study is the relationship between CSA disclosure and the nature of the child-perpetrator relationship. While not found to be a significant moderator in this meta-analysis, it seems plausible that close familial ties with perpetrators in positions of trust and authority might naturally dissuade children from reporting their abuse due to relational allegiance or fear of real or perceived negative consequences of telling, such as family breakdown or displacement from home, particularly if coinciding with an unsupportive nonoffending caregiver response. In light of discrepancies in how intrafamilial

versus extrafamilial relationships were defined across studies and missing data due to the absence of identity disclosure, this unexpected result should be interpreted as preliminary and requires further analysis when more studies become available.

Finally, there is a need for comparative studies on the influence of various forensic interview protocol types on disclosure prevalence, as well as specific questioning techniques that facilitate allegations among the subsets of children at greatest risk for false denials due to motivational barriers.

7. Conclusion

This meta-analysis advances our current understanding of CSA disclosure prevalence in forensic settings. Our results posit that the majority of suspected victims disclose sexual abuse when interviewed. For some children, however, disclosure can be exceedingly difficult, and the consequences of nondisclosure can be detrimental to physical safety and psychological wellbeing. In addition to increasing the likelihood of revictimization and decreasing the likelihood of criminal prosecution, delaying or withholding sexual abuse disclosure has been linked to a heightened risk of adverse mental health sequelae (Bonanno, Noll, Putnam, O'Neill, & Trickett, 2003; Hébert et al., 2009). Recognizing disclosure as a dynamic and nuanced process influenced by a range of intersecting personal and contextual factors can inform the direction of child forensic interview practices and protocols, with the ultimate goal of surmounting barriers and fostering positive outcomes.

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Conflicts of interest

The authors have no conflicts of interest relevant to this article to declare.

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Appendix A

Database: PsycINFO < 1806 to May Week 3 2017 >

Search Strategy

sexual abuse/ or sex offenses/ or incest/ or exp rape/ (32287)
 (sex* adj3 (abus* or assault* or offense* or violen* or coer* or exploit*)).mp. (42402)
 (rape* or molest* or incest*).mp. (15026)
 or/1-3 (50442)
 self-disclosure/ (6646)
 disclos*.mp. (25697)
 5 or 6 (25697)
 4 and 7 (1923)
 (infan* or newborn* or new-born* or neonat* or baby or babies or child* or youth or kid or kids or toddler* or boy* or girl* or adolescen* or teen* or juvenile* or p?ediatric*).mp. (918172)
 8 and 9 (1413)
 limit 8 to (100 childhood < birth to age 12 yrs > or 120 neonatal < birth to age 1 mo > or 140 infancy < 2 to 23 mo > or 160 preschool age < age 2–5 yrs > or 180 school age < age 6–12 yrs > or 200 adolescence < age 13–17 yrs >) (693)
 10 or 11 (1434)

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¹ References marked with an asterisk indicate studies included in the meta-analyses.

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