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Child sexual abuse, disclosure and PTSD: A systematic and critical review

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ABSTRACT

Background: Child sexual abuse (CSA) is a prevalent exposure with potentially serious, negative health consequences, including post-traumatic stress disorder (PTSD) and its symptomatology.
Objective: To conduct a systematic and critical review in order to investigate the relationship between CSA disclosure patterns and PTSD.
Participants and setting: Studies included clinical, college and community-based samples of adults' and children's experiences of CSA.
Methods: We conducted systematic searches in five databases (Medline, Embase, PyscINFO, CINAHL, ERIC, Sociological Abstracts) from database inception to October 17, 2017 using index terms and keywords for CSA, disclosure, and PTSD. We included any English-language, primary studies involving children or adults with experiences of CSA that used quantitative research designs to explore the relationship between disclosure and PTSD. We used systematic critical review methodology in order to investigate the relationship between disclosure and PTSD symptoms and disorders. We also investigated factors that explained the relationship between disclosure and PTSD, such as individual, exposure or environmental factors.
Results: Twenty-two articles reporting 20 studies were included in this review. Studies assessing the relationship between CSA and PTSD tended to account for personal (e.g., gender) and CSA exposure variables (e.g., severity of CSA) only. While authors generally used validated measures to assess for PTSD symptoms and disorders, they tended to use author-generated or unvalidated measures to assess for disclosure process variables.
Conclusion: The relationship between factors that affect disclosure, and responses to disclosure, are not well theorized in quantitative literature. Study findings suggest important avenues for future research, such as the need to assess disclosure longitudinally.

1. Background

Childhood sexual abuse (CSA) is a complex constellation of experiences that involve an adult or older child using a child for sexual gratification and can include, but is not limited to, rape, unwanted touching, threatened sexual violence, exhibitionism, and use of children in pornography or sex work (World Health Organization, 2017). Global estimates suggest experiences of CSA vary drastically across countries and gender, for example, with prevalence for boys ranging from 7.6% to 45% (Moynihan et al., 2018; Stoltenborgh, van Ijzendoorn, Euser, & Bakermans-Kranenburg, 2011). All prevalence figures of CSA likely under-estimate the actual rates of sexual violence experienced by children. CSA is associated with significant, deleterious health consequences across the lifespan, including,

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but not limited to, risky sexual behaviours, depression, anxiety, and conduct disorder (Abajobir, Kisely, Maravilla, Williams, & Najman, 2017; Maniglio, 2010, 2013a, 2013b, 2015). The relationship between CSA and post-traumatic stress symptoms or disorder (PTSD) has been explored extensively with ongoing debate about whether exposure to CSA is a correlate or causal factor for PTSD (Maniglio, 2013a). Furthermore, key systematic reviews have examined relationships between characteristics of CSA and PTSD (Dworkin, Menon, Bystrynski, & Allen, 2017), factors that facilitate or impede disclosure of CSA (Lemaigre, Taylor, & Gittoes, 2017; London, Bruck, Wright, & Ceci, 2008; McElvaney, 2015; Reitsema & Grietens, 2015), and how responses to disclosure impact PTSD (Bolen & Gergely, 2015), but not how disclosure is conceptually related to PTSD. In this article, we explore the relationship between CSA disclosure patterns and PTSD.

Theoretical work on CSA disclosure processes has evolved over time. Early research on children's disclosure of CSA framed disclosure as a process rather than an event (Sgroi, 1982; Sorensen & Snow, 1991; Summit, 1983). For example, in reviewing 234 confirmed sexual abuse cases, Sorensen and Snow (1991) found the following processes in child disclosure of CSA: denial, reluctance, disclosure, recantation, and reaffirmation. Other theories and models have been used to explain the negative impact of CSA experiences. For example, the traumagenic dynamics model suggests that four trauma-related factors (powerlessness, betrayal, stigmatization, and traumatic sexualisation) distort the survivor's cognitive and emotional orientation to the world, which impacts their functioning (Finkelhor & Browne, 1985).

Further theoretical work has framed CSA disclosure processes within a transactional or ecological view of trauma (Cicchetti, Toth, & Maughan, 2000; Curry, Hassouneh-Phillips, & Johnston-Silverberg, 2001). Specific to CSA, authors using the transactional model theorize that "developmental (e.g., victim's age, cognitive abilities) and environmental factors (e.g., family support) may also affect victim responses or moderate relationships between abuse stressors and victim responses" (Spaccarelli & Kim, 1995, p. 1172). Similarly, authors citing the ecological view of trauma and trauma recovery theorize that individual differences in post-trauma responses and recovery are related to a complex interplay of factors related to the person (e.g., gender), exposure (e.g., severity), microsystem (e.g., family support), meso-exosystem (e.g., formal system responses, such as health sector responses), macrosystems (societal or cultural conceptions that impact recovery, such as rape myths), and chronosystem (impact of co-occurring forms of violence exposures, as well as the prevalence of revictimization) (Campbell, Dworkin, & Cabral, 2009). For example, at the microsystem level, lower levels of attachment security has long been cited as a potential outcome of CSA and a moderator of poor psychological adjustment (Aspelmeier, Elliott, & Smith, 2007; Roche, Runtz, & Hunter, 1999).

In addition to adult/children's CSA disclosure processes, many studies suggest that reactions to disclosure, including maternal responses, are an important factor moderating the relationship between disclosure and trauma responses. A recent meta-analysis has characterized non-offending caregiver support following disclosure of CSA, and found that PTSD was not significantly related to non-offending caregiver support (broadly defined to include general and specific support), although the authors note that significant methodological weaknesses in the included studies hinder firm conclusions (Bolen & Gergely, 2015). Beyond disclosure of CSA, theories and models of disclosure have also been applied to understand disclosure of sensitive information in other contexts, such as disclosure of HIV status (Indekeu et al., 2013; Qiao, Li, & Stanton, 2013; Steuber & Solomon, 2011).

While there are a number of theories that account for how PTSD can develop post-trauma, such as emotional inhibition theory, learning theories, schema theories, cognitive theory, dual representation theory, and emotional processing theory (Cahill & Foa, 2014; Frazier, 2012; González-Prendes & Resko, 2012; Sloan & Marx, 2004), if and how disclosure processes mediate or moderate PTSD responses is not always clear. For example, emotional inhibition theory was posed by Pennebaker (1997) and has most often been applied to emotional processing through writing. Early theories by Pennebaker (1997) suggested that disinhibition of emotion was the mechanism of change afforded by writing. Pennebaker (1997) also posited that physical and mental health improvement following writing may result as the person develops mastery over characteristics of the trauma event, through the expression of a more coherent narrative of the experience. Pennebaker's work has been applied to understandings of CSA disclosure, with ongoing questions about the suitability of its application (e.g., does verbal disclosure of CSA benefit those who disclose and when?) (Lamb & Edgar-Smith, 1994). Emotional processing theory, alternatively, more clearly accounts for verbal disclosure. This theory suggests that PTSD emerges from large fear structures that are related to traumatic events and that some people naturally extinguish these fear structures by emotionally processing trauma material in their everyday life through repeated disclosures about their trauma or through confronting situations that remind them of their trauma (Cahill & Foa, 2014). When the fear structure is activated but not accompanied by additional trauma, or when the fear structure is activated but integrated with corrective information, it is modified so that situations and reminders that once triggered trauma reactions no longer do so. According to emotional processing theory, PTSD results when individuals avoid emotional processing of traumatic material. How these "natural" disclosure processes relate to PTSD in young children is less clear. For example, a trial that specifically set out to assess children's processing of CSA trauma narratives in therapy did not find this process to be the active component of treatment (Deblinger, Mannarino, Cohen, Runyon, & Steer, 2011), making it unclear if, when, and how disclosure is beneficial to children.

In this paper we undertake a systematic and critical review (Booth, Papaioannou, & Sutton, 2012), in order to help inform our understanding of how different aspects of disclosure may be associated with variation in levels of risk for PTSD, which in turn may influence the response that is required. Some clinicians have emphasized the need for those exposed to CSA to disclose their experiences, even in circumstances where there is no further risk, and have suggested this would reduce the likelihood of PTSD. Others have prioritized a "universal care" approach that acknowledges the high prevalence rates of various violence exposures and the need to have safe responses, or universal trauma precautions, regardless of these exposures (Public Health Agency of Canada, 2018). These differences reflect broader inconsistencies in policies related to disclosure of violence experiences in healthcare and social service settings with, for example, the U.S. Preventive Services Task Force recommending screening for intimate partner violence (Curry et al., 2018) in spite of limited evidence of effectiveness and the World Health Organization not recommending screening for intimate

Table 1
Inclusion and exclusion criteria.

Inclusion criteria:

1 **Population.** The article explored adults' or children's experiences of disclosure of child sexual abuse (sexual abuse experienced before the age of 18), including clinical, college, and community samples.
2 **Study design.** The article used a quantitative design, such as cross-sectional, cohort, or case-control designs.
3 **Outcomes:** The article explored disclosure patterns and their relationship to PTSD symptoms or diagnosis. Articles using general trauma response measures were included only if they separated out posttraumatic stress scores.
4 **Language, publication type, and timeframe:** The article was English-language, published before October 17, 2017.

Exclusion criteria:

1 **Population:** Articles that reported sexual victimization not in the context of childhood abuse (e.g., adult rape), that looked at disclosure through writing (which tends to be used in laboratory conditions or as a component of therapeutic interventions), or that looked at children's involvement in pornography were excluded.
2 **Study design.** Articles that used a qualitative design, or a design that did not allow for the an exploration of the relationship between disclosure and PTSD in a defined population were excluded (e.g., reviews, opinion papers, case reports, qualitative research)
3 **Outcomes:** Articles that did not look a) how disclosure mediates or moderates PTSD or b) that did not look at PTSD as an outcome were excluded.
4 **Language, publication type, and timeframe.** Non-English articles were excluded, as were non-published manuscripts, such as dissertations, book chapters or reports.

partner violence (World Health Organization, 2013) or child maltreatment (World Health Organization, 2015). Expectations in relation to disclosure, in terms of the potential benefits and harms to trauma responses, are unclear. In this paper we focus on PTSD given its positioning as a common outcome following developmental trauma, including CSA (De Bellis & Zisk, 2014; De Bellis, 2002). Specifically, we sought to identify components that inform the relationship between disclosure and PTSD, such as a) theoretical models, b) measures of disclosure and PTSD, and c) factors that mediate or moderate the relationship between disclosure and PTSD.

2. Methods

Critical reviews seek to identify conceptual contributions in the literature in order to better characterize existing theory or derive new theory (Booth et al., 2012). As this review style can be criticized for lack of transparent inclusion criteria (how studies are selected), in this review we conducted a systematic search of five databases from database inception to October 17, 2017: Medline (1946-), Embase (1947-), PsycINFO (1806-), CINAHL (1981-), ERIC (1966-) and Sociological Abstracts (1952-). Database searches were conducted by an information professional (JRM) and involved index terms and keywords for child sexual abuse (e.g., sexual abuse, assault, victimization, rape), disclosure (e.g., disclosure, self-disclosure), and PTSD (e.g., post-traumatic stress, PTSD, PTSS) (see Appendix 1 in supplementary material for example search). Title and abstracts were screened according to clear inclusion criteria (see Table 1) by two independent authors (JRM, IS), where an article suggested for inclusion by one screener was sufficient to put it forward to full-text review. Full-text articles were also screened by two independent reviewers (JRM, IS), with discrepancies being resolved by consensus. Forward and backward citation chaining on all included articles was conducted in order to complement the search.

Quality appraisal for the present review used the Quality in Prognosis Studies (QUIPS) tool (Hayden, Côté, & Bombardier, 2006). Prognosis studies are investigations of future events, or, relevant to the present review, the evaluation of associations between risk factors and health outcomes in populations of patients. The QUIPS tool evaluates quality by assessing risk of bias across six domains: study participation, study attrition, prognostic factor measurement, outcome measurement, study confounding and statistical analysis and reporting. Each domain can receive a rating of low, moderate, or high risk of bias. Overall, a study may receive a ranking of "low" bias if it received a ranking of low risk across all of the six individual domains; moderate bias if the study received a "low" bias ranking on four or five of the six domains; and high bias if a study received a "low" bias ranking on three or less of the six domains. One reviewer (JRM) completed the appraisal tool for each study and classified the level of bias for each domain; a second reviewer (IS) confirmed the evaluation and any disagreements were resolved through consensus.

Calculations were completed in order to compare how different characteristics of disclosure or reactions to disclosure were related to PTSD diagnosis or symptoms. Given the small number of studies contributing to each comparison and the heterogeneity across studies, effect estimates were not pooled; a narrative summary of each study's results is included in the text. Odds ratio (OR) were calculated for dichotomous outcomes (PTSD diagnosis or counts of participants with clinical levels of PTSD symptoms). ORs that were adjusted for by relevant moderators were preferred, but most studies reported unadjusted ORs. An OR equal to one suggests that an exposure (e.g., disclosure) does not affect an outcome (e.g., PTSD), an OR greater than one suggests an exposure is associated with higher odds of an outcome, and an OR less than one suggests and exposure is associated with lower odds of an outcome (Szumilas, 2010). Standardized mean difference (SMD) values were calculated for continuous outcomes (PTSD symptoms). Based on Cohen (1988) rule of thumb, an SMD value of 0.2 or less indicates a small effect, a value of 0.5 or higher indicates a medium effect and a value of 0.8 or larger indicates a large effect. When authors did not provide measures of spread, these were estimated from other values (e.g., p values, standard error) when possible. All calculations were performed using Wilson's (2001) effect size calculator. When only correlations between variables were reported, they were transformed into Fisher's z using the calculator provided by Wilson (2001). SMD approximations are presented alongside Fisher's z values to allow comparisons across studies. Conversions from Fisher's z to SMD were calculated using the following formula: $d = (2\,r/\sqrt{(1-r^2)})$ (Borenstein, Hedges, Higgins, & Rothstein, 2009).

Evidence was assessed using GRADE (Schünemann, Brożek, Guyatt, & Oxman, 2013), which is a systematic approach to linking

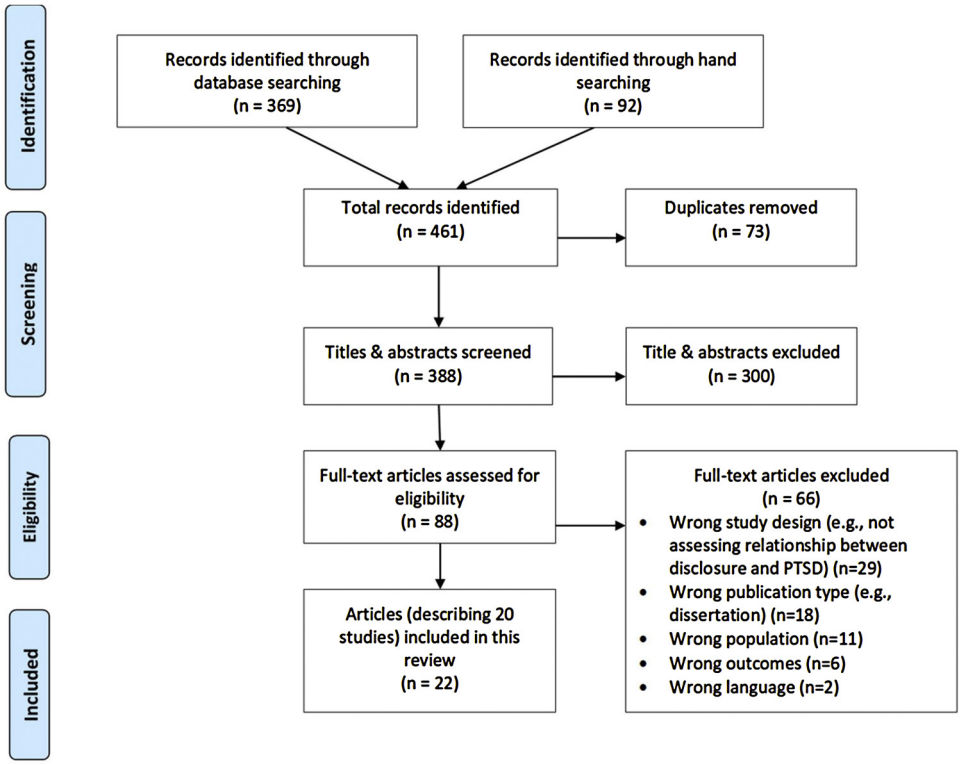

Fig. 1. PRISMA Flow Chart.

assessment of the evidence quality with clinical recommendations. GRADE involves rating the quality of a body of evidence as high, moderate, low or very low; each of the four levels reflects the certainty in the evidence and the likelihood that further research will have an impact on the estimate of effect. A GRADE rating is based on an assessment of five domains: (1) risk of bias (limitations in study designs), (2) inconsistency (heterogeneity) in the direction and/or size of the estimates of effect, (3) indirectness of the body of evidence to the populations, interventions, comparators and/or outcomes of interest, (4) imprecision of results (few participants/events/observations, wide confidence intervals), and (5) indications of reporting or publication bias. A body of evidence starting off with randomized controlled trials is considered "high" quality and then is downgraded to moderate, low, or very low quality based on the five factors listed above. For studies in the present review, while randomization to disclosure comparisons would not be ethical or feasible, a body of evidence starting off with observational studies would start off as "low" certainty. Using the GRADE standards to evaluate the certainty of evidence, the secondary analysis of the randomized controlled trial by Cohen and Mannarino (2000) and the cohort study by Zajac, Ralston, and Smith, (2015) started off at low certainty and, as the remaining studies were cross-sectional, they started off at very low certainty. While there is no lower ranking than "very low" certainty, the evidence would also be downgraded for serious or very serious concerns for risk of bias and further downgraded for imprecision. As such, we have very low certainty in all estimates of effects. Very low certainty evidence means we have very little confidence in the effect estimate and that the true effect is likely to be substantially different from the estimate of effect.

3. Results

A total of 461 records was retrieved from the literature search and citation chaining (see Fig. 1). After a full-text review of 88 articles, 22 articles were included in this review (representing 20 studies). Eighteen studies were cross-sectional (Arata, 1998; Bernard-Bonnin, Hébert, Daignault, & Allard-Dansereau, 2008; Bolen & Lamb, 2007; Broman-Fulks et al., 2007; Cantón-Cortés, Cortés, Cantón, & Justicia, 2011; Crouch, Smith, Ezzell, & Saunders, 1999; Elliott & Briere, 1994; Glover et al., 2010; Gries et al., 2000; Hébert, Tourigny, Cyr, McDuff, & Joly, 2009; Hong & Lishner, 2016; Lam, 2015; Palo & Gilbert, 2015; Roesler, 1994; Ruggiero et al., 2004; Ullman, 2007; Wamser-Nanney, 2017; Wang, Lu, & Tsai, 2016), one was a cohort study (Zajac et al., 2015), and one involved secondary analysis of a randomized controlled trial (Cohen & Mannarino, 2000) (see Appendix 2 in Supplementary material for study characteristics). Only three studies used representative, community samples (Broman-Fulks et al., 2007; Hébert et al., 2009; Ruggiero et al., 2004); the majority of included studies enrolled clinical or college samples. Eleven studies included children only (< 18 years) (Bernard-Bonnin et al., 2008; Bolen & Lamb, 2007; Broman-Fulks et al., 2007; Cohen & Mannarino, 2000; Crouch et al., 1999; Elliott & Briere, 1994; Gries et al., 2000; Lam, 2015; Wamser-Nanney, 2017; Wang et al., 2016; Zajac et al., 2015) and nine studies included adults only (> 18 years) (Arata, 1998; Cantón-Cortés et al., 2011; Glover et al., 2010; Hébert et al., 2009; Hong &

Table 2
Overall classification of study bias for included studies.

Overall bias ranking	Study reference
Low bias	——
Moderate bias	(Broman-Fulks et al., 2007; Ruggiero et al., 2004; Wang et al., 2016)
High bias	(Arata, 1998; Bernard-Bonnin et al., 2008; Bolen & Lamb, 2007; Cantón-Cortés et al., 2011; Cohen & Mannarino, 2000; Crouch et al., 1999; Elliott & Briere, 1994; Glover et al., 2010; Gries et al., 2000; Hébert et al., 2009; Hong & Lishner, 2016; Lam, 2015; Palo & Gilbert, 2015; Roesler, 1994; Ullman, 2007; Wamser-Nanney, 2017; Zajac et al., 2015)

Lishner, 2016; Palo & Gilbert, 2015; Roesler, 1994; Ruggiero et al., 2004; Ullman, 2007). Across all included studies, most of the participants were female.

3.1. Methodological quality of included studies

Overall, included studies had either moderate risk of bias (n = 3) or high risk of bias (n = 17) (see Table 2). With respect to the QUIPS tool domains, most of the studies received a moderate or high risk of bias ranking for the measurements of disclosure (measurement bias), as strategies to assess this factor were often not adequately valid or reliable (n = 19). All studies missed assessment of important potential confounders in the relationship between disclosure and PTSD, which could include co-occurring types of maltreatment or adverse childhood experiences (ACEs) (relevant to all age groups) or interventions known to reduce PTSD (for adults or children who were not disclosing at the time of the study) (n = 20).

3.2. Theories about the relationship between disclosure and PTSD

Only nine studies identified a theoretical framework informing the relationship between disclosure and PTSD. Elliott and Briere (1994) framed disclosure as a process, consistent with the work of Sorensen and Snow, (1991). Influenced by the work of Pennebaker (1995), three studies hypothesized CSA disclosure would mediate trauma responses (Arata, 1998; Gries et al., 2000; Ruggiero et al., 2004). Finally, four studies cited complex factors that moderate the relationship between disclosure processes and trauma responses. Specfically, Cantón-Cortés et al. (2011) investigated the traumagenic dynamics model and a few studies also cited transactional or ecological views of trauma responses (Bernard-Bonnin et al., 2008; Glover et al., 2010; Zajac et al., 2015).

Many studies suggested that reactions to disclosure, including maternal responses, were an important factor moderating the relationship between disclosure and trauma responses. One study (Ullman, 2007) drew upon the betrayal trauma theory to suggest that feelings of betrayal, including betrayal resultant from poor reactions to disclosure, may also moderate the survivor's functioning following abuse. Other studies mentioned reasons for the relationship between poor responses to disclosure and trauma responses in passing, such as by mentioning theories about attachment (Bolen & Lamb, 2007; Cantón-Cortés et al., 2011; Lam, 2015; Zajac et al., 2015).

3.3. Measures of disclosure and PTSD

A variety of methods were used to assess for PTSD symptoms or disorders (see Appendix 3 in supplementary material), including validated child or caregiver self-report scales and interviews with children, with the most prevalent being the Trauma Symptom Checklist (Briere, 1996), which assesses for posttraumatic stress in children (as well as other trauma responses). In studies assessing adults with histories of CSA, a few studies used interview methods to assess for PTSD diagnosis or symptoms and the majority used validated self-reports, such as the Posttraumatic Stress Diagnostic Scale (Foa, 1995).

Conversely, as noted in the limitations for quality appraisals, assessment of disclosure generally involved non-validated or author-generated questions or measures. Studies that used validated measures tended to assess reactions to disclosure, although some studies also assessed reactions to disclosure via non-validated measures. Non-validated or author-generated measures assessed occurrence of level of disclosure (e.g., "Did you ever tell anyone about this (these) incident(s)?"; completeness of disclosure (e.g., no, partial, full disclosure or recanted); timing of disclosure (e.g., "How long after the incident did you first tell someone about it?"); who was first disclosed to (e.g., "Who did you tell first?"); and feelings related to disclosure (e.g., relieved, safe, shame, sad).

3.4. Characterization of disclosure processes and reactions to disclosure in relation to PTSD

Various aspects of the disclosure process were explored, including disclosure vs. no disclosure, disclosure timing, to whom CSA was disclosed, and reactions to disclosure (discussed below). Most studies provided estimates for total PTSD scores only, with only four studies providing estimates for PTSD symptom clusters (Arata, 1998; Glover et al., 2010; Lam, 2015; Wamser-Nanney, 2017). While effects sizes that were adjusted to account for confounding variables would be preferred, only two studies provided disclosure-related outcomes that had been adjusted for by other moderators (Broman-Fulks et al., 2007; Ruggiero et al., 2004). Other studies assessed for moderators in relation to outcomes that were outside the scope of this review. We have very low certainty in all effect estimates presented in Table 3.

Table 3
Effect estimates for disclosure processes or reactions to disclosure in relation to PTSD[a].

Study ID	# Participants	Measure of disclosure or reaction to disclosure	Subgroup	Outcome[b]	OR, SMD, or Zr [95% CI]
Disclosure process					
Broman-Fulks et al. (2007)	319	Disclosure vs. no disclosure[c]	Child	PTSD	OR, 0.72 [0.41, 1.28]
Ruggiero et al. (2004)	238		Adult	PTSD	OR, 1.57 [0.81, 3.05]
Hébert et al. (2009)	128		Adult	PTSD	OR, 0.77 [0.25, 2.34]
Elliott and Briere (1994)	248		Child	PTSD symptoms	SMD, 1.31 [0.82, 1.79]
Ullman (2007)	148		Adult	PTSD symptoms	SMD, 0.35 [0.01, 0.69]
Hébert et al. (2009)	128		Adult	PTSD symptoms	SMD, -0.15 [-0.57, 0.28]
Glover et al. (2010)	85		Adult	PTSD symptoms	SMD, 0.20 [-0.23, 0.63]
Arata (1998)	197		Adult	Intrusion symptoms	SMD, -0.30 [-0.60, 0.01]
				Avoidance symptoms	SMD, -0.53 [-0.84, -0.22]
Elliot and Briere (1994)	39	Recanted disclosure vs. no disclosure	Child	PTSD symptoms	SMD, 0.22 [-0.41, 0.85]
Gries et al. (2000)	6		Child	PTSD symptoms	SMD, 2.41 [0.23, 4.59]
Wang et al. (2016)	55	Full disclosure vs. non-full disclosure	Child	PTSD	OR, 0.68 [0.23, 2.05]
Broman-Fulks et al. (2007)	192	Long-delay disclosure vs. no disclosure	Child	PTSD	OR, 0.49 [0.23, 1.04]
Ruggiero et al. (2004)	175		Adult	PTSD	Adjusted OR, 1.43 [0.73, 2.80] OR, 2.10 [1.04, 4.25]
Hébert et al. (2009)	101		Adult	PTSD	OR, 0.94 [0.30, 2.93]
Broman-Fulks et al. (2007)	192	Short-delay disclosure vs. no disclosure	Child	PTSD	OR, 0.91 [0.49, 1.69]
Ruggiero et al. (2004)	143		Adult	PTSD	OR, 0.92 [0.39, 2.16]
Hébert et al. (2009)	54		Adult	PTSD	OR, 0.35 [0.06, 2.00]
Ullman (2007)	99	Delayed disclosure vs. nondelayed disclosure	Adult	PTSD symptoms	SMD, 0.77 [0.31, 1.22]
Broman-Fulks et al. (2007)	218	Disclosure to mother vs. disclosure to someone else	Child	PTSD	Adjusted OR, 0.22 [0.07, 0.70] OR, 0.21 [0.08, 0.57]
Broman-Fulks et al. (2007)	319	Disclosure to mother vs. disclosure to someone else or no disclosure	Child	PTSD	OR, 0.22 [0.09, 0.58]
Ruggiero et al. (2004)	286		Adult	PTSD	OR, 1.28 [0.73, 2.26]
Reactions to disclosure					
Wamser-Nanney (2017)	252	MSSQ, emotional support	Child	PTSD symptoms	Zr, -0.12 [-0.24, 0.00] (SMD, -0.24)
				Intrusion symptoms	Zr, -0.11 [-0.23, 0.014] (SMD, -0.22)
				Avoidance symptoms	Zr, 0.04 [-0.08, 0.16] (SMD, 0.08)
				Arousal symptoms	Zr, -0.03 [-0.15, 0.09] (SMD, -0.06)
		MSSQ, blame/doubt		PTSD symptoms	Zr, 0.07 [-0.05, 0.19] (SMD, 0.14)
				Intrusion symptoms	Zr, 0.07 [-0.05, 0.19] (SMD, 0.14)
				Avoidance symptoms	Zr, -0.11 [-0.23, 0.01] (SMD, -0.22)
				Arousal symptoms	Zr, 0.04 [-0.08, 0.16] (SMD, 0.08)
Zajac et al. (2015)	118 (baseline)	MSSQ, emotional support	Child	PTSD symptoms	Zr, -0.08 [-0.26, 0.10] (SMD, -0.16)
		MSSQ, blame		PTSD symptoms	Zr, -0.16 [-0.34, 0.02] SMD, -0.32
		MSQ-CR, emotional support		PTSD symptoms	Zr, 0.02 [-0.16, 0.20] (SMD, 0.04)
		MSQ-CR, vengeful arousal		PTSD symptoms	Zr, 0.30 [0.12, 0.48] (SMD, 0.63)
	57 (9 month follow-up)	MSSQ, emotional support		PTSD symptoms	Zr,-0.28 [-0.55, -0.02] (SMD, -0.61)
		MSSQ, blame		PTSD symptoms	Zr, 0.03 [-0.24, 0.30] (SMD, 0.06)
		MSQ-CR, emotional support		PTSD symptoms	Zr, -0.04 [-0.31, 0.23] (SMD, -0.08)
		MSQ-CR, vengeful arousal		PTSD symptoms	Zr, -0.26 [0.00, 0.53] (SMD, -0.56)
Bolen and Lamb (2007)	90	PRIDS, parental emotional support	Child	PTSD symptoms	Zr, -0.06 [-0.27, 0.15] (SMD, -0.13)

(*continued on next page*)

Table 3 (*continued*)

Study ID	# Participants	Measure of disclosure or reaction to disclosure	Subgroup	Outcome[b]	OR, SMD, or Zr [95% CI]
Crouch et al. (1999)	80	CITES-R, social support	Child	PTSD symptoms	Zr, -0.06 [-0.28, 0.16] (SMD, -0.12)
		CITES-R, negative reactions by others		PTSD symptoms	Zr, 0.55 [0.33, 0.77] (SMD, 1.32)
Lam (2015)	74	Negative feeling	Child	Intrusion symptoms	Zr, 0.78 [0.54, 1.01] (SMD, 2.46)
				Avoidance symptoms	Zr, 0.68 [0.45, 0.91] (SMD, 1.84)
		Positive feeling		Intrusion symptoms	Zr, 0.26 [0.02, 0.49] (SMD, 0.53)
				Avoidance symptoms	Zr, 0.32 [0.09, 0.55] (SMD, 0.68)
		Satisfaction		Intrusion symptoms	Zr, -0.09 [-0.32, 0.14] (SMD, -0.18)
				Avoidance symptoms	Zr, -0.13 [-0.36, 0.10] (SMD, -0.26)
		Helpfulness		Intrusion symptoms	Zr, 0.08 [-0.15, 0.31] (SMD, 0.16)
				Avoidance symptoms	Zr, 0.09 [-0.14, 0.32] (SMD, 0.18)
Cohen and Mannarino (2000)	49	PSQ, total	Child	PTSD symptoms	Zr, 0.15 [-0.14, 0.44] (SMD, 0.30)
		PSQ, support		PTSD symptoms	Zr, 0.17 [-0.12, 0.46] (SMD, 0.34)
		PSQ, blame		PTSD symptoms	Zr, 0.08 [-0.21, 0.37] (SMD, 0.15)
Hong and Lishner (2016)	91	Sexual abuse specific invalidation	Adult	PTSD symptoms	Zr, 0.41 [0.20, 0.62] (SMD, 0.90)
Roesler (1994)	178	Negative reaction at young age	Adult	PTSD symptoms	SMD, 0.51 [0.20, 0.82]
Glover et al. (2010)	94	Non supportive responses to disclosure vs. no disclosure	Adult	PTSD symptoms	SMD, 0.48 [-0.04, 1.00]
				Reexperiencing symptoms	SMD, 0.55 [0.02, 1.07]
				Avoidance symptoms	SMD, 0.23 [-0.28, 0.75]
				Hyperarousal symptoms	SMD, 0.49 [-0.02, 1.01]
Palo and Gilbert (2015)	38	SRQ, average helpfulness/ hurtfulness score	Adult	PTSD symptoms	Zr, 0.33 [0.00, 0.66] (SMD, 0.70)

Note. OR = odds ratio, SMD = standardized mean difference, Zr = Fisher's z; CI = confidence intervals; CITES-R = Children's Impact of Traumatic Events Scale-Revised; MSSQ = Maternal Self-Report Support Questionnaire; MSQ-CR = Maternal Support Questionnaire, Child Report; PRIDS = Parental Reaction to Incest Disclosure Scale; SRQ = Social Reactions Questionnaire.

[a] Two studies (Cantón-Cortés et al., 2011, Bernard-Bonnin et al., 2008) did not provide enough data about outcomes of interest (e.g., means, PTSD counts, correlations for outcomes of interest) to be used in OR, SMD, or Zr calculations and as such are not summarized in this table. These studies contributed to other findings in the manuscript.

[b] Dichotomous outcomes included PTSD diagnosis and counts of participants with PTSD symptoms.

[c] To calculate SMD values for disclosure vs. no disclosure the following classifications were made. For Ruggerio 2004 and Hébert 2009, the PTSD counts for the short-delay and long-delay disclosure groups were combined together and compared to the no disclosure group. For Elliot 1994, mean PTSD symptoms for children who "recanted" disclosure were averaged with mean PTSD symptoms for children with "partial" and "credible" disclosures and compared to the "nondisclosing evidence" group. For Glover 2010, the "low" and "high" negative responses PTSD means were averaged and compared to the no disclosure group.

3.4.1. Disclosure vs. no disclosure

Six studies reported data about the relationship between disclosure versus no disclosure and PTSD diagnosis or symptoms (Arata, 1998; Broman-Fulks et al., 2007; Glover et al., 2010; Hébert et al., 2009; Ullman, 2007) and four studies reported the relationship between the "fullness" or "completeness" of disclosure and PTSD symptoms (Elliott & Briere, 1994; Gries et al., 2000; Ullman, 2007; Wang et al., 2016). Studies did not report a standardized way to ask about disclosure.

OR and SMD values for these comparisons are presented in Table 3. In terms of PTSD diagnosis or counts, two studies suggest a trend towards a lower rates of PTSD in those participants who disclosed CSA experiences versus those who did not disclose (Broman-Fulks et al., 2007; Hébert et al., 2009) and one study suggests a lower rates of PTSD in those that did not disclose (Ruggiero et al., 2004). For example, 24% of adolescents reported PTSD in the no-disclosure group and 18% reported PTSD in the disclosure group (for a difference of 6%) (Broman-Fulks et al., 2007). Hébert et al. (2009) reported that for adults, 19% reported PTSD in the no-disclosure group and 5% reported PTSD in the disclosure group (for a difference of 14%). In contrast, Ruggiero et al. (2004) reported that for adults, 27% reported PTSD in the disclosure group and 19% reported PTSD in the no-disclosure group and (for a difference of 8%). In terms of PTSD symptoms, two studies reported lower PTSD symptoms scores for those participants who disclosed CSA experiences (Arata, 1998; Hébert et al., 2009) and three studies reported lower PTSD symptoms scores for those that did not disclose

CSA experiences (Elliott & Briere, 1994; Glover et al., 2010; Ullman, 2007).

Strategies to determine the "fullness" of disclosure also varied across studies, with studies of children tending to involve medical evaluation and one study in adults using a retrospective self-report. For example, Elliott and Briere (1994) used multidisciplinary team evaluations involving interviews with the child, non-offending caregiver (when possible), and medical examination. They classified disclosures as "credible" or "partially credible" depending on a number of factors, such as a "consistent, detailed, contextually-embedded, developmentally age-appropriate account of at least one incident" (Elliott & Briere, 1994, p. 264). They also classified children with CSA experiences who did not disclose into two groups: those who never disclosed, but external evidence suggested that abuse occurred, and those who disclosed previously, but later recanted the disclosure (also with external evidence that abuse occurred). Wang et al. (2016, p. 1071) assessed written psychiatric evaluation reports, based on evaluations by multidisciplinary teams, and described "full" disclosures as those where the child gave the "identity of the perpetrator…and some descriptive information about the sexual act", whereas children were classified as having "non-full" disclosures when they refused to discuss the CSA experiences, disclosed partially, or denied CSA. Gries et al. (2000) had a therapist rank the level of disclosure and compared PTSD symptoms in those children who recanted their disclosure versus non-disclosing children.

SMD values for this comparison are presented in Table 3. Two studies (Elliott & Briere, 1994; Gries et al., 2000) showed a trend towards lower PTSD symptoms for those children who did not disclose CSA experiences vs. those who recanted disclosures and one study (Wang et al., 2016) showed a trend towards lower PTSD symptoms in those children who had "full" disclosures vs. those that had "nonfull" disclosures.

3.4.2. Disclosure timing

Four studies offered findings about the relationship between PTSD diagnosis or symptoms in relation to disclosure timing (Broman-Fulks et al., 2007; Hébert et al., 2009; Ruggiero et al., 2004; Ullman, 2007). Three studies classified short-delay or prompt disclosures as disclosures that happened within a month of participants' first CSA experience and long-delay disclosure as any time after a month (Broman-Fulks et al., 2007; Hébert et al., 2009; Ruggiero et al., 2004). One study classified disclosure timing using five ordinal response categories ranging from "immediately after" to "years later" and classified delayed disclosure as anything occurring beyond "immediately after" the exposure (Ullman, 2007).

OR and SMD values are presented in Table 3. These findings suggest a very weak trend towards lower rates of PTSD in those who had a short-delay disclosure versus no disclosure (Broman-Fulks et al., 2007; Hébert et al., 2009; Ruggiero et al., 2004). Specifically, 24% of adolescents reported PTSD in the no-disclosure group and 22% reported PTSD in the short-delay disclosure group and group (for a difference of 2%). For adults, Hébert et al. (2009) reported that 19% had PTSD in the no-disclosure group and 7% had PTSD in the short-delay disclosure group (for a difference of 12%) and Ruggiero et al. (2004) reported that 19% PTSD in the no-disclosure group and 17% had PTSD in the short-delay disclosure group (for a difference of 2%).

Findings for long-delay disclosure are mixed, with a study in adolescents (Broman-Fulks et al., 2007) and one study (Hébert et al., 2009) in adults showing a trend towards lower rates of PTSD when participants did not disclose versus when they had a long-delay disclosure. Another study in adults (Ruggiero et al., 2004) showed lower rates of PTSD when participants did not disclose versus when they had a long-delay disclosure. Specifically, 24% of adolescents reported PTSD in the no-disclosure group and 13% reported PTSD in the long-delay disclosure group and (for a difference of 11%). Hébert et al. (2009) reported that 19% of adults had PTSD in the no-disclosure group and 18% of adults had PTSD in the long-delay disclosure group (for a difference of 1%). Ruggerio et al. (2004), in contrast, found that 33% of adults reported PTSD in the long-delay disclosure group and 19% reported PTSD in the no-disclosure group (for a difference of 14%). Somewhat similar to Ruggiero et al. (2004), findings from Ullman (2007) found higher PTSD symptom scores among adult participants who delayed their disclosure versus those who did not delay their disclosure (Ullman, 2007).

3.4.3. Persons that participants disclosed their CSA experiences to at time of exposure or following

Very few studies offered descriptions about who participants disclosed CSA experiences to at the time of, or following, their exposure. Those studies which offered this information described how participants most often disclosed to mothers (Broman-Fulks et al., 2007; Ruggiero et al., 2004), friends (Lam, 2015; Ruggiero et al., 2004), or other informal sources (Ullman, 2007). Four studies offered descriptions about participants' contact with formal sources, such as counselors, social workers, police, or medical or mental health professionals (Arata, 1998; Broman-Fulks et al., 2007; Gries et al., 2000; Ullman, 2007). Only two studies offered findings about how rates of PTSD differed depending on to whom participants disclosed CSA experiences. These studies showed contrasting findings; one study involving adolescents showed lower rates of PTSD if participants disclosed to their mother versus someone else (Broman-Fulks et al., 2007) and the study in adults showed a weak trend towards lower rates of PTSD in those who disclosed to someone else (or did not disclose) versus those who disclosed to their mother (Ruggiero et al., 2004).

3.4.4. Reactions to disclosure

Ten studies reported characteristics about reactions to disclosure in relation to PTSD symptoms, most reporting correlations between these variables (Bolen & Lamb, 2007; Cohen & Mannarino, 2000; Crouch et al., 1999; Glover et al., 2010; Hong & Lishner, 2016; Lam, 2015; Palo & Gilbert, 2015; Roesler, 1994; Wamser-Nanney, 2017; Zajac et al., 2015). Five studies assessed various aspects of "support" (e.g., emotional support, parental support) (Bolen & Lamb, 2007; Cohen & Mannarino, 2000; Crouch et al., 1999; Wamser-Nanney, 2017; Zajac et al., 2015), five studies assessed various aspects of negative reactions to disclosures (Crouch et al., 1999; Glover et al., 2010; Hong & Lishner, 2016; Palo & Gilbert, 2015; Roesler, 1994), and one study assessed feelings associated with disclosure, as well as helpfulness and satisfaction with disclosure experience (Lam, 2015).

Most of the investigated relationships between characteristics of reactions to disclosure and PTSD symptoms showed small or no effect (see Table 3). However, studies assessing reaction to disclosure showed a trend towards higher PTSD symptoms when participants perceived CSA-specific invalidation (Hong & Lishner, 2016), negative reactions by others (Crouch et al., 1999), negative reactions to disclosure as a child (Roesler, 1994), non-supportive responses (Glover et al., 2010), and hurtfulness of reactions to disclosure (Palo & Gilbert, 2015). Finally, one study used a five-point ordinal scale to rate feelings towards disclosure and found that higher ratings of negative feelings (e.g., shame, sadness) or positive feelings (e.g., relieved, safe) following disclosure was associated with higher PTSD symptoms (Lam, 2015).

4. Discussion

Through this critical and systematic review, we sought to identify conceptual contributions in the literature that characterized the relationship between CSA and PTSD, in order to better understand past or current theory and to derive new theory. Studies assessing the relationship between disclosure processes and PTSD show an inconclusive relationship at this point in time – it is unclear if, when and how disclosure of CSA results in reduced PTSD. The findings of this review suggest that in relation to CSA, much work needs to be done to better characterize disclosure processes and associated PTSD responses, including attention to: theories that attend to the multi-faceted nature of trauma responses (e.g., social ecological theory) and the differences between children's and adults' experiences; what mediators and moderators are essential to analysis of CSA disclosure processes and associated trauma responses, beyond attention to poly-victimization, ACEs, and CSA chronicity; and how specific PTSD symptom clusters theoretically relate to CSA disclosure processes (e.g., are avoidance symptoms associated with delayed disclosure?). Research attending to these theoretical concerns would benefit from validated measures related to disclosure processes, as well as from well-designed, prospective, longitudinal studies of CSA disclosure processes and associated trauma responses that use representative, community samples.

Ecological theory has much to offer our understandings of the relationship between disclosure and PTSD, as it incorporates many of the distinct factors discussed by different authors. Studies included in the present review primarily focused on personal (e.g., gender), exposure (e.g., severity) and microsystem factors (e.g., family support), with little or no emphasis on understanding how PTSD responses are moderated by meso-exosystem, macrosystems, and chronosystem factors (Campbell et al., 2009). In this review, only four studies described participants' disclosures to formal sources (Arata, 1998; Broman-Fulks et al., 2007; Gries et al., 2000; Ullman, 2007); this may be because participants preferred to disclose to informal sources of support (Broman-Fulks et al., 2007; Lam, 2015; Ruggiero et al., 2004; Ullman, 2007). As exposure to CSA may lead to ongoing health concerns (Daigneault, Vézina-Gagnon, Bourgeois, Esposito, & Hébert, 2017) that, depending on system responses, may require re-disclosure of CSA at the meso-exosystem levels (Varcoe, Wathen, Ford-Gilboe, Smye, & Browne, 2016), understanding the impact of disclosure processes and reactions beyond microsystem responses is an important area of future research.

The World Health Organization has signalled the importance of health sector responses to CSA with the publication of the first guidelines for children who have experienced sexual abuse (World Health Organization, 2017). This guidance offers best practice advice specific to first-line responses, or the "minimum level of (primarily psychological) support and validation of their experience that should be received by all children and adolescents who disclose sexual abuse to a health-care (or other) provider" (World Health Organization, 2017, p. viii). This minimum level of support includes attention to the importance of listening respectfully and empathetically, offering non-judgemental and validating responses, taking action to enhance safety and to minimize harm, providing age-appropriate information, etc. Additional recommendations are available in these guidelines about other aspects of CSA disclosure responses, such as psychosocial interventions for children with mental health symptoms or disorders. For example, the guidelines suggest that cognitive behavioural therapy with a trauma focus may be considered for children exposed to sexual abuse who have PTSD symptoms.

Notably absent from many of the studies in the present review is any indication of *the child's safety* in the context of CSA experiences. While four studies assessed for some aspect of child safety (e.g., physical abuse, exposure to intimate partner violence, contact with child protective services) (Bernard-Bonnin et al., 2008; Cantón-Cortés et al., 2011; Elliott & Briere, 1994; Wamser-Nanney, 2017), none of these studies adjusted the effect estimates of interest to this review depending on these exposures. Research led by Turner, Finkelhor, and Ormrod, (2010) has shown that, in a national sample addressing adolescents' experiences of violence, 92% of rape victims were victims of other forms of violence and that poly-victimization is a key predictor of trauma responses. As such, it is unclear if samples with high trauma responses in the present review are qualitatively different (i.e., experiencing poly-victimization) or if disclosure processes are different for children who experience multiple forms of violence. For example, early research about child disclosures of CSA has suggested that recantation can be an indicator, although not a confirmation, of safety concerns in the home (Sorensen & Snow, 1991). It is possible that children experiencing multiple forms of maltreatment may be less likely to disclose CSA to their non-offending caregiver, given ruptures already existent in the family. For example, Kellogg and Menard (2003) found that children in homes with IPV were more likely to cite fear of the perpetrator as a reason for delay in disclosure than children who had not lived in homes with IPV. Relatedly, other ACEs, such as parental mental health or substance use, have also been found to be related to children's trauma responses (Oral et al., 2015). How multiple maltreatment exposures and other ACEs impact disclosure processes and any associated mental health symptoms is an important area of future research.

While Pennebaker (1995) have written about the potential benefits of disclosure on physical and mental health, findings largely based on laboratory experiments using written accounts of CSA, questions remain about if and when the benefits of disclosure apply to those who have experienced CSA (Ullman, 2011). For example, one study investigating disclosure versus no disclosure in children found that children who disclosed had higher levels of PTSD symptoms (Elliott & Briere, 1994) and two studies in children showed that children who recanted their disclosure had higher levels of PTSD symptoms than those who did not disclose (Elliott & Briere,

1994; Gries et al., 2000). These findings are complicated by the fact that participants with high levels of PTSD may not be impacted by negative reactions to disclosure, while individuals with moderate levels of PTSD may be significantly impacted by negative reactions to disclosure (Fletcher, Elklit, Shevlin, & Armour, 2017; Glover et al., 2010). While it is likely that children show higher PTSD scores following disclosure due to acute stages of trauma (Briere & Scott, 2013; O'Donnell, Elliott, Lau, & Creamer, 2007), the relationship between disclosure and PTSD responses in children leads to ongoing questions about the mode of disclosure – verbal, written, or with young children, acting-out behaviours – and how the each mode relates to the child's safety and felt sense of security. High PTSD scores following disclosure also leads to questions about perpetrator disclosure dynamics. For example, when a perpetrator of sexual abuse has admitted to abuse and there are no further concerns about safety, is disclosure of CSA from the child necessary? Or when child disclosure of CSA is necessary for safety, what is the minimal level of care necessary to ensure that, for example, forensic interviews do the least possible harm? Much has been written about the potential benefits of Child Advocacy Centers (CACs) and multidisciplinary teams in reducing stress associated with forensic interviews by their attention to coordination of investigation activities, minimization of re-telling of CSA experiences, and interviewing children in child-friendly spaces, although future research is needed to clarify these findings (Herbert & Bromfield, 2016, 2017; Herbert, Walsh, & Bromfield, 2018; Tonmyr & Gonzalez, 2015).

4.1. Strengths, limitations, and future research

A strength of this review is the use of systematic review procedures to find and evaluate studies, as well as critical review methodology to consider methodological and theoretical limitations of included studies. It is unclear at this point if a meta-analysis of disclosure characteristics in relation to PTSD is warranted, given the methodological and conceptual limitations of measurements related to disclosure processes. While the purpose of the review was not to evaluate all trauma responses associated with CSA, a limitation of the review is the explicit focus on PTSD, as compared to a broader understanding of mental health symptoms or distress associated with disclosures of CSA. Future work that examines a range of outcomes associated with CSA may offer more conclusive findings about the potential benefits and harms related to the disclosure processes, and advance the empirical basis for clinical guidelines (World Health Organization, 2017). Similarly, while the relationship between disclosure and general levels of support was not examined due to an existing meta-analysis (Bolen & Gergely, 2015), inclusion of studies evaluating general support may have added additional understandings of meso-exosystem responses to disclosure. While clinical and college samples represent important sub-populations, future research would benefit from additional, well-designed, longitudinal studies with representative community-based samples that assess the relationship between disclosure and trauma responses. Finally, it is important to consider sex and gender issues as part of the research on CSA disclosure, given the differences in CSA prevalence rates, as well as the issue of resilience processes in tandem with understanding disclosure impacts (Zahradnik et al., 2010).

5. Conclusion

Research investigating the relationship between disclosure processes and PTSD responses is in the early stages of development and additional research is needed in order to better understand if, when and why CSA disclosure is beneficial. Ecological theories of trauma responses help to draw attention to the many different ways in which disclosure can occur over time, such as to close friends and families (microsystem) or healthcare providers (exosystem), as well as the impact of broader cultural factors (macrosystem) and the impact of co-occurring or recurring violence exposures (chronosystem). As many studies evaluate only individual, exposure, and specific microsystem factors, it is perhaps not surprising to find that the literature indicates an inconsistent relationship between disclosure processes and PTSD.

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Conflict of interest

The authors declare no potential conflicts of interest.

Authors' contributions

IS and CW conceived of an earlier version of this manuscript and JRM and CW conceived of the later design of the review. JRM and IS completed data extraction and analysis. JRM wrote the first draft of the manuscript. HLM contributed clinical knowledge to key outcomes of this review. JRM, IS, HLM, and CW all edited and approved the final manuscript.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.chiabu.2019.04.006.

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