


Regular Article

The effect of childhood maltreatment on adult survivors' parental reflective function, and attachment of their children: A systematic review

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Abstract

Background: Parental reflective function (PRF) is a candidate mechanism in the transmission of intergenerational trauma. This systematic review examined (1) the association between parental history of childhood maltreatment and PRF, (2) how PRF relates to attachment in children of parent survivors, and (3) whether PRF moderates the association between parental maltreatment history and child attachment. **Methods:** Ten databases were searched (from inception to 10th November 2021). Inclusion criteria were primary study, quantitative, parent participants, measures of childhood maltreatment, and postnatal PRF. Exclusion criteria were qualitative, intervention follow-up, gray literature, or a review study. Risk of bias was assessed using recommended tools. Data were narratively synthesized.

Results: One-thousand-and-two articles were retrieved, of which eleven met inclusion criteria ($N = 974$ participants). Four studies found a significant association between parental childhood maltreatment and disrupted PRF, six did not, one found mixed results. One study reported the association between childhood maltreatment and attachment (nonsignificant results).

Discussion: There is no clear evidence PRF is routinely disrupted in parent survivors, though there is high heterogeneity in studies. Future research should standardize design to better understand whether PRF is a candidate mechanism in intergenerational trauma.

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Keywords: attachment; child maltreatment; mentalizing; parenting; reflective function

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Highlights

- This is the first systematic review of the relationship between a parent's history of childhood maltreatment, their parental reflective function, and attachment of their children
- Studies did not consistently find that when a parent was maltreated as a child, they had poorer reflective function.
- Most studies excluded participants with serious mental health issues, even though this is common in survivors of childhood maltreatment (i.e., they excluded a large portion of the target population).

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Introduction

Approximately one in three people are survivors of childhood maltreatment (Stoltenborgh et al., 2015). The World Health Organization (WHO) defines childhood maltreatment as “all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment . . . resulting in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power” (Horswell & Istfan, 2006, p. 3). The consequences of being exposed to maltreatment include a variety of physical health (especially inflammatory) diseases, abnormalities in brain and endocrine structure and function, psycho-social difficulties (e.g., difficulties in relationships, aggression), and specific outcomes related to specific forms of maltreatment experienced (e.g., aggression and physical abuse, emotional abuse, and mental health issues; Carr et al., 2020; Felitti et al., 2019).

Children of survivors of childhood maltreatment have also been found to have higher rates of mental illness, physical illness, disability, and familial dysfunction (Montgomery et al., 2019;

Woods-Jaeger *et al.*, 2018). The transmission of consequences of childhood maltreatment has been referred to as *intergenerational trauma*. It is therefore imperative to better understand target factors to halt the transmission of intergenerational trauma, ideally, as early in the parenting journey as possible.

The perinatal and postnatal period of parenthood is one of the most important opportunities to break the cycle of intergenerational trauma (Chamberlain, Gee, Harfield, *et al.*, 2019). This is because the transition to becoming a parent is both a time of risk and healing for the parent. Factors associated with pregnancy, birth and early parenting may trigger memories of past traumatic experiences (e.g., loss of bodily autonomy and extreme stress), though also represent an opportunity for the parent to resolve and learn from their past experiences (e.g., Iyengar *et al.*, 2019).

Theoretical background: reflective function and attachment

Reflective function (also known as *mentalization*) is defined as an individual's ability to understand the association between inner mental states (thoughts, feelings, emotions, etc.) and behavior (Fonagy & Target, 1997). Examples of poor reflective function include difficulty understanding thoughts and intentions of others, or in understanding one's own motivation for saying or doing things. For individuals with difficulty in reflective function, interacting with others can be highly confusing and distressing, and they can have a higher risk of experiencing severe mental health issues (Slade, 2005). Reflective function is thought to be a key skill in facilitating secure attachment of infants of parent survivors of childhood maltreatment, which in turn is associated with better mental and physical health outcomes across the lifespan (Doyle & Cicchetti, 2017).

Secure attachment refers to an individual's adaptive pattern of beliefs, expectations, and interactions with others in close relationships and forms in response to nurturing, attentive, and responsive caregiving from infancy (Bowlby, 1988). Although attachment style is malleable to change with experiences across the lifespan, children who have been maltreated are significantly less likely to be securely attached to caregivers, which in turn creates risk for relational and mental health difficulties (Widom *et al.*, 2018).

Further theoretical evidence for the role of reflective function in the intergenerational transmission of childhood maltreatment consequences (i.e., insecure attachment, increased risk for adverse mental, physical, and social health outcomes) comes from research which found that reflective function ability may be "transmitted" from a parent to their child (Pajulo *et al.*, 2018), such that parents with lower levels of reflective function have children with relatively lower levels of reflective function. This is thought to result from the lack of a safe environment and/or responsive caregiver to be attuned to the child and help them to develop knowledge of inner mental states (Camoirano, 2017). Studies have found that not only can reflective function ability be passed from parents to their children, but parental reflective function (PRF) can be an important predictor of emotion regulation and attachment in infants, school-aged children, and adolescents (Camoirano, 2017; Slade, 2005).

Parental reflective function as a mechanism of intergenerational trauma

PRF is a related but not identical construct to reflective function in general (Anis *et al.*, 2020) and refers to a parent's ability to treat the

child as a psychological agent (i.e., having their own thoughts and motivations; Slade, 2005). A parent with healthy PRF will therefore see their child as a separate entity from themselves, with a unique inner world and motivations which they are curious to better understand. This is thought to be a specific context and application of the core socio-cognitive skill of reflective function, without which, the development of secure attachment is significantly less likely (Ensink *et al.*, 2016).

In the initial validation study of the Parental Reflective Function Questionnaire (PRFQ), Luyten *et al.* (2017) conducted an exploratory and confirmatory factor analysis in clinical and nonclinical populations. They found three main dimensions of PRF across populations: level of parental curiosity and interest in the child's mental states (e.g., "I am often curious to find out how my child feels"), prementalizing modes (e.g., "When my child is fussy he/she does this just to annoy me"), and degree of certainty of mental states (e.g., "I always know why my child acts the way he/she does") (Luyten *et al.*, 2017). According to this measure, a parent is classified as having healthy or "high" PRF when they are high on parental curiosity, but low on degree of prementalizing and certainty modes. Luyten *et al.* (2017) found that poorer PRF showed convergent validity through significant associations with poor parental attachment to their own child, high stress, and low emotional availability.

Traditionally, as in the PRFQ (Luyten *et al.*, 2017), PRF has been measured through questionnaires and interviews which aim to quantify the "mind-mindedness" or extent to which a parent (typically the mother) communicates interest in or awareness of the child's inner states (Camoirano, 2017). However, researchers and clinicians have increasingly noted that sole reliance on verbal measures of PRF may be, at best, inadequate in capturing the true presence of reflective function, and at worst, biased against disadvantaged groups of parents (e.g., linguistically diverse or low socioeconomic status; Camoirano, 2017). Shai and Belsky (2011) were among the first to raise this issue, and as a solution operationalized a nonverbal measure of PRF – Parental Embodied Mentalizing – which aims to capture implicit evidence of PRF via patterns of bodily attunement between the parent and child (e.g., the parent treating an infant as owning its own body). Although parental embodied mentalizing has shown significant associations with child secure attachment (Gagné *et al.*, 2021) and skills such as toddler emotion recognition (Afek *et al.*, 2022), it remains seldom used and inadequately explored in PRF and childhood maltreatment research.

There are a variety of ways in which childhood maltreatment is thought to effect PRF. These include a lack of opportunity to practice emotional co-regulation with an attachment figure (Bethell *et al.*, 2016), the absence of a safe and nurturing environment in which to explore their inner world safely (Byrne *et al.*, 2019), or a frightening caregiver who does not provide predictability or comfort in their response patterns (Luyten & Fonagy, 2015).

While each of these situations is thought to lead to disrupted PRF and consequently attachment relationship difficulties, they entail vastly different caregiving environments and suggest the possibility that qualitative differences in experiences of childhood maltreatment lead to different adult outcomes (Infurna *et al.*, 2016; Messman-Moore & Bhuptani, 2017). Although cumulative exposure to maltreatment has been strongly associated with adverse outcomes (Sheridan *et al.*, 2020), a plethora of research document differences in predicted outcomes according to the type, timing, severity, or frequency of maltreatment experienced in addition to multi-victimisation or poly-victimization status (Jackson

et al., 2019; Lee et al., 2018). Despite this, the predominant approach in the childhood maltreatment literature has been to consider it as a unidimensional experience (Toth & Manly, 2019). Consideration for the nuance in form of childhood maltreatment experienced is therefore an integral part of understanding the association between parental history of childhood maltreatment and their PRF.

Parental reflective function-based clinical interventions

The promising evidence for PRF as a mechanism in the intergenerational transmission of trauma consequences has led to a variety of PRF-based parenting interventions (e.g., Byrne et al., 2019; Cohen, 2016; Stob et al., 2019). Preliminary results of such interventions have shown significant improvements in PRF and attachment (Ashton et al., 2016), as well as parenting confidence and sensitivity (Byrne et al., 2019). However, no systematic review or meta-analysis has examined the association between a parent's history of childhood maltreatment, their PRF when they themselves become parents, and subsequent impact on their own children. There is therefore a clear and imminent need to systematically evaluate this association, given the substantial risk of intergenerational harm for parents and children, and the fact that PRF therapies are already being incorporated into research and practice with vulnerable families.

Aims

To address gaps in understanding of the role of PRF in perpetuating or interrupting cycles of intergenerational trauma, the present study had four main aims: 1) to systematically examine the consistency, strength, and direction of an association between a parent's history of childhood maltreatment and their PRF; 2) to examine the association between PRF of maltreatment survivors and the attachment of their children; 3) to explore the potential for PRF to moderate the association between a parent's history of childhood maltreatment and the attachment status of their children; and 4) to examine the effect of qualitative differences in the experience of child maltreatment (e.g., type, timing, and severity) upon the aforementioned associations. Addressing these questions will help to understand if childhood maltreatment is consistently associated with lower PRF in parent survivors, and attachment outcomes of their children. Understanding of how qualitative differences in childhood maltreatment experiences effect this relationship will facilitate targeted interventions for survivors. This will provide the much-needed high level evidence to inform PRF-informed interventions and research.

Method

Protocol and registration

This review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). A protocol for the review was registered on PROSPERO (ID CRD42020223594).

Participants

The population of interest were postnatal parents who had experienced childhood maltreatment prior to age 18 (even if only a subsample of a larger population). All parent populations were considered.

Exposure

The exposure of interest was childhood maltreatment (physical abuse, physical neglect, emotional abuse, emotional neglect, and/or sexual abuse during childhood prior to age 18 years), as defined by the WHO (2016).

Outcomes

The primary outcome was PRF in parents who had survived childhood maltreatment and attachment of their children. However, after the initial search it became clear that very few studies measured attachment in addition to childhood maltreatment and PRF, therefore only the latter two outcomes were made compulsory. Studies were ultimately included if they employed a formal measure of PRF and childhood maltreatment. The secondary outcome was qualitative differences in the type, timing or frequency/severity of childhood maltreatment.

Study designs

All primary studies with an observational and quantitative design were included, including longitudinal and intervention studies (using only first wave and baseline data, to be comparable to other single-wave observational studies). Results were not limited to English, with the understanding that articles in other languages would initially be screened using Google Translate, and that the full translation would be requested from authors if the article made it to the full-text screening stage. Inclusion of articles in various languages was preferable to reduce the risk of publishing bias (Dobrescu et al., 2021).

Exclusion criteria

Studies were excluded if they measured prenatal PRF, based on literature which documents substantial identity reorganization during childbirth and initial experiences as a parent (Amos et al., 2015; Chamberlain, Gee, Brown, et al., 2019). Studies were also excluded if a formal measure of childhood maltreatment or PRF was not used; they reported results from the second wave of an intervention study; the exposure to maltreatment did not occur before age 18; maltreatment was not reported specific to the parent population; or childhood maltreatment was not measured separately from traumatic events not related to parent-child relationship behavior (e.g., accidents, family deaths). Articles were excluded if they had a purely qualitative or case study design; consisted of editorials, letters, or conference abstracts; were from gray literature; or if a review article.

Search strategy and data collection

A search strategy was created by combining terms related to the following key concepts with "AND": childhood maltreatment, parenting, and reflective function. Search terms included both keyword and thesaurus (Medical Subject Headings; MeSH) terms for "childhood maltreatment" AND "parenting" AND "reflective function." This strategy was developed in collaboration between three of the authors (EvR, CC, and AW) and a research librarian. The original search strategy was piloted in *PsycINFO* (final strategy publicly documented on PROSPERO). Ten databases were searched for studies published before November 10, 2021: *CINAHL*, *The Cochrane Library*, *Embase*, *JB*, *ProQuest*, *PubMed*, *MEDLINE*, *PsycINFO*, *Scopus*, and *Web of Science*. Results from this search are outlined in Figure 1.

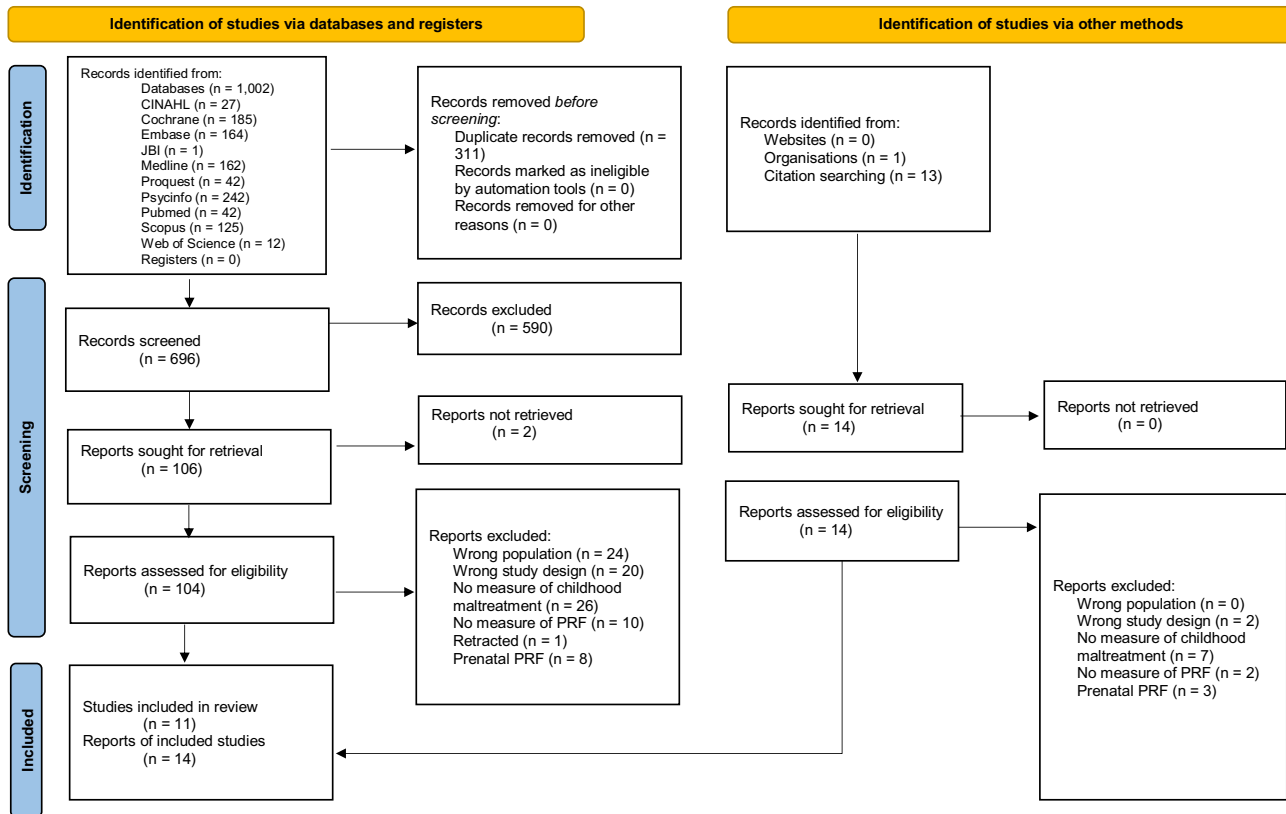


Figure 1. Flowchart for the inclusion of articles. Note. Parental reflective function is represented by the acronym PRF.

References were downloaded into a citation manager (Zotero) and de-duplicated. Two reviewers (EvR and AW) independently screened titles and abstracts. An overly inclusive approach was taken, such that discrepancies were carried over into the full-text review stage. The full texts of identified studies were again independently screened (EvR and AW). Articles which resulted in discrepancies between the first two reviewers ($n = 8$) were sent to an independent third reviewer, who assessed them autonomously (CC). Papers which resulted in further uncertainty ($n = 4$) were then discussed by all three reviewers. The references of the final articles were then searched for any additional relevant studies ($n = 14$; EvR), to follow the same review process.

Data extraction

A data extraction template was created between EvR, CC, and NH. This was prototyped on three selected papers before being applied to others. Extraction was undertaken independently by two reviewers (EvR and AW), with discrepancies discussed between the reviewers, and referred to a third author (CC) where necessary. Fields of data extraction included: country of study, design and setting, participants (number, recruitment source, parent age, child age, inclusion and exclusion criteria); information about measures of childhood maltreatment, PRF, and attachment (name of measure, reference, what it captures, descriptive scores where available, information about validation); conclusions and results relevant to our research questions (i.e., association between childhood maltreatment, PRF, and attachment); and limitations reported by the study.

Assessment of quality of studies and risk of bias

Quality of included studies (and therefore risk of bias) was assessed using the Study Quality Assessment Tools as published by the National Heart, Lung, and Blood Institute (U.S. Department of Health & Human Services, 2020). Specifically, we used their quality assessment tools for case control, observational cohort, and cross-sectional studies. Quality was assessed separately (EvR and AW) at the same time as data was extracted. Discrepancies were resolved by discussion between the two reviewers (EvR and AW).

Data synthesis

Data were extracted by two researchers (EvR and AW) and compared for mismatches (by discussion) before being compiled into an overall summary table under each of the extraction fields. This information was then summarized and narratively synthesized (EvR).

Results

Study selection

The initial search retrieved 1,002 potentially relevant articles (see Figure 1). After duplicates were removed, 696 articles remained for title and abstract screening. From these, 106 articles were approved for full-text review, with 12 of these articles meeting all criteria for inclusion. A text review of the final 12 articles resulted in 14 additional full-texts sought for retrieval, of which only one study met all criteria. The total number of articles included in the final review

was therefore 14, representing 11 unique studies (summarized in Table 1). There were three instances where two studies reported on the same dataset. In these instances, one of the studies was chosen to report upon depending on which study format more similarly resembled our research questions (Table 1).

Two studies were excluded despite meeting most criteria, due to measuring PRF prenatally (Berthelot et al., 2019; Ensink, Leroux, et al., 2017). As stated in the exclusion criteria, research suggests that PRF changes rapidly after an individual becomes a parent, and that prenatal and postnatal PRF can vary substantially within the same individual (limiting the appropriateness of comparing studies that measure PRF before versus after the child is born). The study by Kolomeyer et al. (2016) similarly met almost all criteria; however, it was ultimately excluded because it was not possible to separate childhood maltreatment scores from other adverse childhood experiences not explicitly related to abuse or neglect by a caregiver (e.g., presence of parental mental illness, exposure to parental substance abuse, and criminal behavior). Another study by Borelli et al. (2019) met all predefined criteria; however, it was excluded due to purposely recruiting parents *and* children who had experienced sexual abuse, which was considered to be an unanticipated confounding factor (none of the other studies specified abuse history in the children of survivors).

Meta-analyses were not deemed appropriate due to significant heterogeneity in study design, the proportion of maltreated parents in the sample commonly being unreported ($n = 4$ studies), varying cutoffs for maltreatment scores (e.g., any instance of maltreatment versus moderate-severe cutoffs), and incompatible outcomes reported (discussed in-depth in study characteristics section below). It was decided that a meta-analysis of the available literature would be unlikely to be representative of the true relationship between childhood maltreatment, PRF, and attachment.

Characteristics of included studies

Characteristics of included studies are summarized in Table 1. Four of the 11 studies (36%) were conducted in the United States of America, four were conducted in Europe (two in Norway, one each from Italy and Switzerland; 36%), and one each from Australia, Canada, and Chile (27%). None of the studies recruited a population where all parents had a history of childhood maltreatment. Two studies did not report any inclusion or exclusion criteria. Of the nine studies that did report criteria, the most common exclusion criteria were current or prior serious mental illness ($n = 6$; 54%), followed by having a child with a disability ($n = 4$; 36%), substance use ($n = 3$; 27%), characteristics of the child's birth (e.g., premature, or multiparity; $n = 3$; 27%), or the parent experiencing a serious physical health illness ($n = 3$; 27%).

Design

Nine of the 11 studies (82%) used a cross-sectional design and two (18%) were cross-sections within longitudinal studies. Of the cross-sectional studies, only two (18%) involved a case-control design, of which, only one was matched, while the remaining studies used cohort designs in a variety of settings (e.g., university laboratory, online questionnaires).

Participants

In total, 974 parents were included in the studies selected for review. Four studies (36%) did not report the prevalence of childhood maltreatment within their sample and measures and

thresholds to determine prevalence varied considerably. Therefore, it is not possible to confidently report the number of participants who experienced childhood maltreatment within the 11 studies. These studies were still included, however, given that it is highly likely that at least 30% of their total samples included parents with a history of childhood maltreatment (the global average norm in community samples; Stoltenbergh et al., 2015), and that in clinical samples the proportion of parents with a history of childhood maltreatment is typically even higher than 30% (Devi et al., 2019).

Of the four studies which did not report prevalence of childhood maltreatment within the parent population, two reported a range, standard deviations and mean score of childhood maltreatment which indicated it was present in high levels. Two of these four studies did not give any such indication. However, the studies were kept for inclusion due to the theoretically high likelihood of substantial levels of childhood maltreatment history being present in parents (particularly in clinical samples), and the need to generate what evidence is available in this area given that there is currently no systematic review of the relationship between childhood maltreatment history and PRF. However, this was a primary reason for not conducting a meta-analysis.

Eight studies (73%) were conducted with mothers, two (18%) with fathers, and one (0.09%) with a variety of primary caregivers. The exact population of mothers varied considerably, with four of the eight studies investigating mothers from a community sample; two examining clinical samples (one looking at parents with substance use disorder, the other borderline personality disorder features) one examining a sample of mothers with childhood maltreatment histories versus a control group; and one study examining adolescent or young adult mothers only.

The two studies investigating solely fathers involved (1) fathers who had perpetrated interpersonal violence and (2) fathers with substance use disorder (SUD) or violence issues (using a control group of fathers without SUD or violence issues). Finally, only one study examined a variety of forms of caregiving (mother, father, step-parents, grandparent, aunts, or uncles), consisting of 51.8% mothers and 40.2% fathers.

Five studies asked parents about infant-aged children (3–16 months), one looked at toddlers (19–35 months), three involved young children (2.5–8 years old), one examined older children (8 years and older), and one study did not report the mean age of children.

Measures

Only one study used a measure which explored all types of childhood maltreatment, as well as timing and frequency/severity (Traumatic Antecedents Questionnaire; Luxenberg et al., 2001). The most common measure of childhood maltreatment was the Childhood Trauma Questionnaire (Bernstein et al., 2003; $n = 5$, 45%), followed by the interview version of the Childhood Experiences of Care and Abuse (Bifulco et al., 1994; $n = 2$, 18%). All studies employed self-report, retrospective measures of childhood maltreatment history. However, some studies only reported on total childhood maltreatment scores despite having the capacity to also examine subtypes. Of the 11 studies, seven (64%) reported only on total scores of childhood maltreatment, two (18%) reported on total scores and subtypes of childhood maltreatment, one (0.09%) examined only subtypes, and finally one (0.09%) study examined only two types of childhood maltreatment (physical abuse and sexual abuse; Moser et al., 2019).

Table 1. Characteristics of included studies ($N = 11$)

Study & location	Participants	Measure of Childhood Maltreatment	Measure of Reflective Function	Measure of Child Attachment
Ensink <i>et al.</i> , 2019 Canada	$N = 88$ community sample of mothers; $n(\text{CM}) = 30\%$ of total population; Child age: six months for Mini-PRFI, 16 months for Strange Situation Procedure (Ainsworth <i>et al.</i> , 1978).	Childhood Experiences of Care and Abuse Interview ^a (Bifulco <i>et al.</i> , 1993); Self-report questionnaire; CM Mean (SD) scores: not reported; Validated measure.	Mini-Parental Reflective Function Interview (Ensink <i>et al.</i> , 2007); Semi-structured interview; Whole sample $M = 4.46$, $SD = 1.40$; Non-validated measure.	Strange Situation Procedure (Ainsworth <i>et al.</i> , 1978); Observation-based measure; Validated measure.
Håkansson <i>et al.</i> , 2018 (reported); Kristiansen <i>et al.</i> , 2020 Norway	$N = 43$ mothers with Substance Use Disorder (SUD); $n(\text{CM}) =$ not reported, however, range of CM scores indicates all participants experienced at least one type of CM; Child age (months): $M = 8.6$, $SD = 3.8$, Range = 4–18	Traumatic Antecedent Questionnaire (Van der Kolk, Spinazzola, & Hopper, 1995); Semi-structured interview; Mean (SD), range: Emotional abuse: 9.3 (2.4), 2–12 Physical abuse: 6.2 (3.6), 0–12 Neglect: 8.4 (3.2), 0–12 Sexual Abuse: 5.6 (3.4), 0–12; Validated measure.	Parent Development Interview-Revised (20-items), Norwegian translation; Semi-structured interview; Mean (SD), range: PRF: 2.91 (1.71), 0–6; Validated measure.	None.
Huth-Bocks <i>et al.</i> , 2014; Stacks <i>et al.</i> , 2014 (reported) United States of America	$N = 83$ mothers from a community sample, over-sampled for CM; $n(\text{CM}) = 38\%$ “severe” CM, 69.6% “any type” of CM; Child age (months): 16 months at measurement of PRF and attachment.	Childhood Trauma Questionnaire (Bernstein & Fink, 1998); Self-report questionnaire; CM Mean (SD) scores: 43.72 (16.43); Validated measure.	Parent Development Interview (Slade <i>et al.</i> , 2004) – short form, 30-item version; Semi-structured interview; Mean (SD), range of PRF: 4.57 (SD), 1–8 Validated.	Strange Situation Procedure (Ainsworth <i>et al.</i> , 1978); Observation-based measure; Validated measure.
Milan <i>et al.</i> , 2020 United States of America	$N = 146$ mothers from a community sample; $n(\text{CM}) = 50$ with moderate-severe CM scores; Mean child age (years): not reported; Range (years) = 3–18	Childhood Trauma Questionnaire (Bernstein & Fink, 1998); Self-report questionnaire; CM Mean (SD), range, scores: not reported; Validated measure.	Parental Reflective Functioning Questionnaire—Certainty domain (Luyten <i>et al.</i> , 2017); Self-report questionnaire; Mean (SD): Certainty subdomain: 4.06 (1.17) Prementalization subdomain: 2.15 (1.02); Interest/curiosity subdomain: 5.73 (.90) Measure as a whole validated.	None.
Mohaupt & Duckert, 2016 Norway	$N = 36$ fathers who were voluntarily participating in therapy after perpetrating interpersonal violence; $n(\text{CM}) =$ exact population number not provided, but prevalence of CM subtypes experienced ranged from 14 to 50%. Therefore, reasonable to assume majority CM population; Child age (years): $M = 5.7$, $SD = 2.5$.	The traumatic events checklist (Nijenhuis, Van Der Hart, & Kruger, 2002); Self-report questionnaire; CM Mean (SD), range, prevalence: Emotional Neglect: 5.0 (4.9), 0–12, 50%; Emotional Abuse: 5.5 (4.6), 0–12, 53%; Physical abuse: 4.3 (5.3), 0–21, 43%; Sexual abuse: n.r. (n.r.), 14% Validated measure.	Parent Development Interview-Revised (Slade <i>et al.</i> , 2004; number of items not reported); Semi-structured interview; Mean (SD), range: 3.4 (0.9), 2–6; Validated measure.	None.
Moser <i>et al.</i> , 2019 Switzerland	$N = 48$ mothers from stratified sample, purposely recruited mothers with and without history of childhood physical abuse; $n(\text{CM}) = 26$ mothers with physical abuse history; Child age (months): $M = 27.75$, $SD = 8.2$.	The Brief Physical and Sexual Abuse Questionnaire (Marshall <i>et al.</i> , 1998) and the Traumatic Life Events Questionnaire (Kubany <i>et al.</i> , 2000). Semi-structured clinical interview; CM Mean (SD) scores: not reported; Validated measure.	Working Model of the Child Interview (Zeanah <i>et al.</i> , 2000) – Using the parental reflective function coding scheme created for the Parent Development Interview (Slade <i>et al.</i> , 2004) Semi-structured interview; Mean (SD), range: Mothers with history of childhood physical abuse: 4.29 (0.96);	None.

(Continued)

Table 1. (Continued)

Study & location	Participants	Measure of Childhood Maltreatment	Measure of Reflective Function	Measure of Child Attachment
			Mothers without history of childhood physical abuse: 4.79 (0.92) Validated measure.	
Newman-Morris et al., 2020 Australia	<i>N</i> = 61 mothers with Borderline Personality Disorder features; <i>n</i> (CM) = unknown child age (months): <i>M</i> = 5.3, <i>SD</i> = 3.2, Range = 0–12.	Childhood Trauma Questionnaire (Bernstein & Fink, 1998); Self-report questionnaire; CM Mean (<i>SD</i>): 62.8 (19.2); Validated measure.	Parent Development Interview (45-items; Aber et al., 1985; Slade et al., 2004); Semi-structured interview; Mean (<i>SD</i>): Sample 1: 4.7 (1.2); Sample 2: 3.6 (1.1); Total sample: 4.2 (1.3); Validated measure.	None.
Albizzati et al., 2020; Riva et al., 2019 (reported) Italy	<i>N</i> = 63 adolescent and young adult mothers; <i>n</i> (CM) = 50.8% experienced “some kind of severe” CM (i.e., approximately <i>n</i> = 32); Child age (months): 3 (fixed).	Childhood Experiences of Care and Abuse coding system (Bifulco et al., 1994) as applied to the Adult Attachment Interview (George et al., 1996); Coding systems applied to adult attachment interviews, measures type, and severity. CM Mean (<i>SD</i>), range, prevalence: not reported; Emotional neglect by mother: 14.3% ^a Emotional neglect by father: 8.1%; Physical neglect by mother: 27%; Physical neglect by father: 40.3%; Sexual abuse: 6.3%; Physical abuse: 11.3%; Psychological abuse: 4.8%; Validated measure.	Adult Attachment Interview (George et al., 1996) with Reflective Function Scale (Fonagy et al., 1998); Semi-structured interview; Mean (<i>SD</i>): 2.84 (1.6); Validated measure.	None.
San Cristobal et al., 2017 Chile	<i>N</i> = 125 mothers from medium-low socioeconomic status; <i>n</i> (CM) not reported, and do not include range of subscales; Child age (months): <i>M</i> = 44.65, <i>SD</i> = 3.74, Range = 36–54.	Childhood Trauma Questionnaire (Bernstein et al., 2003); Self-report questionnaire; CM Mean (<i>SD</i>), range <i>n.r.</i> , scores: “Physical abandonment” <i>M</i> (<i>SD</i>): 1.45 (0.77); “Emotional abandonment” <i>M</i> (<i>SD</i>): 1.9 (0.95); “Physical negligence” <i>M</i> (<i>SD</i>): 1.49(0.54); “Emotional negligence” <i>M</i> (<i>SD</i>): 1.94 (0.93) Unclear whether Spanish version used was validated.	Parental Reflective Functioning Questionnaire (Luyten et al., 2009), 30-items, translated in Mexico; Self-report questionnaire; Only provide <i>M</i> (<i>SD</i>) but not range for prementalization subdomain: 2.516 (1.216) Validated measure.	None.
Stover & Kiselica, 2014 United States of America	<i>N</i> = 79 fathers, approximately half with SUD/Violence problems, half without; <i>n</i> (CM) unclear, but likely substantial given range and average of childhood trauma scores; Child age (years): <i>M</i> = 3.41, <i>SD</i> = 1.35, Range = not reported.	Childhood Trauma Questionnaire (Bernstein & Fink, 1998); Self-report questionnaire; CM Mean (<i>SD</i>), range, scores: <i>M</i> = 59.14, <i>SD</i> = 9.94, range = 44–92 (possible range = 28–168) Validated measure.	Parent Development Interview – 40 items (Slade et al., 2004); Semi-structured interview; Mean (<i>SD</i>), range: 3.14 (.86), actual range 2–5; Validated measure.	None.
Wang, 2021 United States of America	<i>N</i> = 202 parents from Mturk: 51.8% mother, 40.2% father, 2% step-mother, 3% step-father, 2% grandmother, .5% aunt, .5% uncle; <i>n</i> (CM): 42 (21.3 %) experienced one type of childhood maltreatment, 34 (17.3 %) had two, 24 (12.2%) had three, 13 (6.6 %) had four, and 12 (6.1 %) had five; child age (years): <i>M</i> = 10.91, <i>SD</i> = 3.58, Range = 5–18.	Subscales of the Adverse Childhood Experiences Questionnaire (CDC, 2003); Self-report questionnaire; CM Mean (<i>SD</i>), range, scores: not reported; Measure as a whole validated.	Parental Reflective Functioning Questionnaire – Certainty domain (Luyten et al., 2017); Self-report questionnaire; Mean (<i>SD</i>), range: Prementalizing 2.78 (1.01), 1–5.83 Certainty 3.67 (1.48), 1–7 Interest 5.84 (0.9 (1.75–7) Validated measure.	None.

Note. Parental reflective function is represented by the acronym PRF, childhood maltreatment is represented by the acronym CM, substance use disorder is represented by the acronym SUD.
^aThis information was provided by the corresponding author via email and is not observable in the published manuscript.

Most studies ($n = 10$, 91%) asked about a parent's PRF in relation to their own child (as opposed to a general measure of reflective function, or a measure that asks about the parent's relationship with their own caregiver. Five studies (45%) used the Parent Development Interview (Slade *et al.*, 2004); however, the format of this measure varied substantially (e.g., from 20 to 45 items depending on the study). Three studies (27%) used the PRFQ (Luyten *et al.*, 2017); however, each study only reported on one subdomain of the PRFQ (either the certainty domain or the prementalization). One study assessed a parent's reflective function with their own caregiver through the Adult Attachment Interview (George *et al.*, 1996) with the Reflective Functioning Scale (Fonagy *et al.*, 1998) applied. Only two of the 11 studies (18%) involved a measure of child attachment, with both using the Strange Situation paradigm (Ainsworth *et al.*, 1978).

Risk of bias

Five studies were assessed as being of "good" quality (i.e., low risk of bias) according to the NHLBI criteria (U.S. Department of Health & Human Services, 2020). Five studies were assessed as being of "fair" quality and having some risk of bias, predominantly due to not describing results by subtypes of childhood maltreatment ("levels of exposure," criteria 10), absence of inclusion or exclusion criteria (criteria four), or using measures without supported validity (e.g., preliminary validation or using subscales of validated measures; criteria nine). One study was assessed as being of "poor" quality in relation to our research questions, primarily due to a lack of inclusion/exclusion criteria, and inability to interpret results (labels did not match those in the method, and results regarding sexual abuse were omitted without explanation).

Narrative synthesis findings

Childhood maltreatment and PRF

Major outcomes and quality of studies are summarized in Table 2. Four of the 11 studies (36%) found a significant association between a parent's history of childhood maltreatment with PRF, while six (54%) did not. One study (0.09%) found mixed results, such that the total maltreatment score and most subtypes of maltreatment (emotional abuse, emotional neglect, and sexual abuse) were not significantly correlated with PRF, except for childhood physical abuse, which was negatively correlated with PRF.

Significant associations between childhood maltreatment and PRF. All four studies which found a significant association between a parent's maltreatment history and PRF (one of these being an indirect effect; Wang, 2021) showed a negative association (i.e., higher childhood maltreatment scores were associated with poorer PRF). Three of the four studies reported the number of parents with a history of childhood maltreatment within the larger sample, ranging from 26 to 50 participants (total sample range = 36–202 participants). Only one of these studies was conducted with a clinical population (mothers with SUD). Two of these studies examined overall childhood maltreatment scores, while the other two explored specific subtypes of childhood maltreatment.

Håkansson *et al.* (2018) found a moderate-strong negative association between four subtypes of childhood maltreatment (emotional abuse, neglect, sexual abuse, physical abuse) and PRF, and that combined these subtypes explained 45% of the variance in PRF (see Table 2). However, this study also found that after controlling for mental health and executive function, only emotional abuse significantly predicted PRF.

Two studies found a significant association between childhood physical abuse and PRF, with one of these (Moser *et al.*, 2019) noting differences in neuroimaging of brain regions associated with PRF (specifically the regions subserving empathy and emotion regulation), when comparing mothers with and without a history of childhood physical abuse. Finally, one of these studies (Wang, 2021) did not examine whether childhood maltreatment history had a *direct* effect upon PRF, but did find a significant *indirect* effect on two subdomains of PRF (positive for prementalization, negative for interest/curiosity) via parental emotion regulation (nonsignificant indirect effect for certainty). In other words, the study by Wang (2021) found that higher scores of childhood maltreatment predicted difficulties with emotion regulation in parents, which in-turn predicted a higher likelihood of misattributing their child's inner states (e.g., "they are fussy to annoy me"; prementalizing domain), a lower likelihood of being interested and curious about their child's inner mental states, though did not predict over-certainty regarding what the child was thinking and feeling.

Nonsignificant associations between childhood maltreatment and PRF. Five of the six studies which found a nonsignificant association between childhood maltreatment and PRF showed a negative relationship. One study reported a nonsignificant positive relationship between childhood maltreatment scores and PRF (i.e., higher scores of childhood maltreatment were associated with better PRF); however, this study reportedly had few fathers with severe childhood maltreatment histories (exact prevalence not reported; Stover & Kiselica, 2014).

Three of the six studies which found a nonsignificant association did not report the sample size of parents with a history of maltreatment within their overall sample. Of those that did report the number of maltreated parents in their sample (range = 26–31 participants with maltreatment history, overall sample range = 36–125 participants), all three were nonclinical populations, and one was with adolescent and young mothers (aged 14–21 years old; Riva Crugnola *et al.*, 2019). Most of these six studies ($n = 5$) reported upon total childhood maltreatment scores, while one reported on both total scores and subtypes (San Cristobal *et al.*, 2017).

Modifiable factors

None of the included studies examined potential moderating or mediating factors between a parent's history of childhood maltreatment and their PRF. However, of the studies that found a significant association between childhood maltreatment and PRF, the following extraneous variables were found to be significantly associated with childhood maltreatment and PRF: mental health and executive function (Håkansson *et al.*, 2018); alcohol and substance abuse (Mohaupt & Duckert, 2016), and emotion regulation skills (Wang, 2021). These variables are therefore important to investigate in future studies examining the relationship between childhood maltreatment and PRF.

The role of attachment

Only two studies measured the attachment of the child, in addition to a parent's history of childhood maltreatment and PRF ability (Ensink *et al.*, 2019; Stacks *et al.*, 2014). Ensink *et al.* (2019) did not report statistical results in relation to childhood maltreatment as preliminary analyses showed no significant association with other study variables. Neither study explored the potential moderating role of PRF between a parent's history of childhood maltreatment and the attachment of their own child. Stacks *et al.* (2014) reported a significant association between secure child attachment

Table 2. Major outcomes and quality rating of included studies

Study & location	Question 1: Are higher scores of childhood maltreatment (CM) associated with poorer parental reflective function (PRF)?	Question 2: Are higher parental scores of childhood maltreatment associated with higher likelihood of insecure attachment of their children?	Question 3: Does PRF moderate the relationship between higher parental scores of childhood maltreatment and insecure attachment of their children?	Quality Rating ^a
Ensink et al., 2019 Canada	Mothers with abuse histories did not have significantly lower PRF scores ($p = .07$, r -value not reported).	Mother's abuse history not significantly correlated with key study variables in preliminary analyses, therefore left out of reporting.	Study did not explore any potential moderation effects of PRF.	Fair
Håkansson et al., 2018 (reported); Kristiansen et al., 2020 Norway	After controlling for mental health and executive function, only emotional abuse was significantly associated with PRF ($B = -.28$, $p < .01$). Mothers with negative to low PRF reported significantly more emotional abuse ($F = 20.8$, $df = 1$, $p < .01$), physical abuse ($F = 5.7$, $df = 1$, $p < .05$), neglect ($F = 6.6$, $df = 1$, $p < .01$), and sexual abuse ($F = 7.7$, $df = 1$, $p < .01$) compared to mothers with adequate to high PRF.	Attachment not measured	Attachment not measured	Good
Huth-Bocks et al., 2014; Stacks et al., 2014 (reported) United States of America	CM and PRF were not significantly correlated ($r = -.05$, p -value not reported).	Child attachment was not significantly correlated with CM ($r = -.07$, p -value not reported); Analysis of Variance showed nonsignificant p -value (looked at four groups of attachment, with CM experiences as differences), $F = 1.80$, $p = 1.54$.	Study did not explore any potential moderation effects of PRF	Good
Milan et al., 2020 United States of America	Multivariate Analysis of Variance indicated overall maltreatment group difference in PRF scores (Wilks Lambda $F(2, 142) = 7.61$, $p < .001$, $\eta^2_p = .10$). Follow-up univariate tests showing significant differences on the certainty domain of the Parental Reflective Function Questionnaire (PRFQ_Certainty): $F(1,143) = 12.16$, $p < .01$, $\eta^2_p = .08$; Mothers with a CM history differed significantly (independent samples t -test, $F = 2.095$, $p = .001$) from mothers without on PRF_Certainty, but not the other two domains in the PRFQ (Prementalizing modes, and interest and curiosity in mental states) – data provided by author; CM mothers had lower scores on the PRFQ_Certainty: CM: $M(SD) = 3.60$ (1.00) Non-CM: $M(SD) = 4.29$ (1.19), on the 1–5 scale ($d = -.63$).	Attachment not measured	Attachment not measured	Good
Mohaupt & Duckert, 2016 Norway	PRF did not correlate with compound measures of trauma history. There was a moderate negative relationship between having experienced physical abuse in childhood and PRF; Childhood Maltreatment (total) and PRF: $r = -.21$, nonsignificant p -value Childhood Physical Abuse and PRF: $r = -.34$, $p < .05$; Childhood Emotional Abuse and PRF: $r = -.9$, non-significant p -value; Childhood Emotional Neglect and PRF: $r = -.20$, nonsignificant p -value; Childhood Sexual Abuse and PRF: $r = -.05$, nonsignificant p -value.	Attachment not measured	Attachment not measured	Good
Moser et al., 2019 Switzerland	Parental reflective function was significantly lower among mothers with a history of childhood physical abuse: $t(160) = 2.10$, $p < .05$ Regions subserving emotion regulation and empathy were associated with parental	Attachment not measured	Attachment not measured	Fair

(Continued)

Table 2. (Continued)

Study & location	Question 1: Are higher scores of childhood maltreatment (CM) associated with poorer parental reflective function (PRF)?	Question 2: Are higher parental scores of childhood maltreatment associated with higher likelihood of insecure attachment of their children?	Question 3: Does PRF moderate the relationship between higher parental scores of childhood maltreatment and insecure attachment of their children?	Quality Rating ^a
	reflective functioning; yet these regions were not featured in maltreated mothers.			
Newman-Morris et al., 2020 Australia	CM scores were not significantly correlated with PRF scores ($r = -.04$, p -value not reported).	Attachment not measured	Attachment not measured	Fair
Albizzati et al., 2020; Riva Crugnola et al., 2019 (reported) Italy	PRF was not significantly different between mothers with and without CM history ($t = .81$, $p = .42$). PRF was not significantly correlated with cumulative CM ($r = -.09$, p -value not reported); Did not specifically explore modifiable factors between maternal CM history and PRF, but did find that maternal CM history predicted negative emotional regulation with infant.	Attachment not measured	Attachment not measured	Good
San Cristobal et al., 2017 Chile	PRF (Prementalization) correlation values with: “physical abandonment”: $r = .05$, $p =$ non-significant; “Emotional abandonment”: $r = .035$, $p =$ non-significant; “physical negligence”: $r = .048$, $p =$ non-significant; “emotional negligence”: $r = .160$, $p < .10$ In regression analyses no CM subtype predicted prementalization, but physical neglect \times insecure attachment did: $\beta = 0.34$, $p < 0.05$.	Attachment not measured	Attachment not measured	Poor
Stover & Kiselica, 2014 United States of America	PRF and CM not significantly correlated: $r = .06$, exact p -value not reported; Concluded that less education and drug use were associated with lower PRF, however, did not report in association with CM.	Attachment not measured	Attachment not measured	Fair
Wang, 2021 United States of America	Correlations between CM and PRF not reported. CM directly predicted child’s behavioral problems ($\beta = .24$, $p < .01$), suggested child behavior problems partially mediated by parent’s emotion regulation and parental prementalizing.	Attachment not measured	Attachment not measured	Fair

Note. Parental reflective function is represented by the acronym PRF, childhood maltreatment is represented by the acronym CM.

^aNational Heart Lung and Blood Institute measure (U.S. Department of Health & Human Services, 2020).

style and maternal PRF (see Table 2), however, no significant associations were found between child attachment style and a mother’s childhood maltreatment history. This relationship was negative, however, suggesting that there was a nonsignificant trend towards secure attachment styles of children and lower maltreatment history scores in mothers. This study also excluded mothers if they had a history of “non-prescription drugs, maternal history of bipolar or psychotic mental illness” (Stacks et al., pp. 518). The results from Stacks et al. (2014) therefore suggest that there may be factors other than PRF which influence the relationship between childhood maltreatment history of parent survivors and attachment of their children, though PRF was supported as being a key skill for facilitating secure attachment in survivor’s children.

Discussion

The present study sought to systematically review and meta-analyse (1) the association between a parent’s history of childhood maltreatment and their PRF, (2) whether parent survivors’ PRF predicts their child’s attachment, and (3) whether PRF moderates the association between parental history of childhood maltreatment and poorer PRF. We also sought to explore whether qualitative differences in the form of childhood maltreatment experienced (e.g., type, timing, frequency/severity) influenced these relationships. We identified 11 studies which met our criteria, however, only our first research question could be reasonably addressed, due to a lack of studies which measured child attachment in addition to parental childhood maltreatment history and PRF. A meta-

analysis was not deemed appropriate due to heterogeneity in many aspects of study design (e.g., population type, level of maltreatment severity), and insufficient information about the number of participants who had experienced childhood maltreatment within the overall study samples.

Four of 11 studies found a significant association between higher levels of childhood maltreatment and poorer PRF in parent survivors of childhood maltreatment, while six found a nonsignificant association. One study found mixed associations, depending on the level of childhood maltreatment evaluated, such that total maltreatment scores did not significantly predict poorer PRF, but history of childhood physical abuse did (Mohaupt & Duckert, 2016). However, almost all studies showed a negative association (whether significant or nonsignificant) between more severe experiences of childhood maltreatment in parents, and poorer PRF, except for one (Stover & Kiselica, 2014). The study which did not find a negative relationship also did not report the prevalence of childhood maltreatment in the sample, was of "fair" quality, and the authors noted that there were few fathers with severe childhood maltreatment experiences (Stover & Kiselica, 2014). This poses the possibility that a negative association does exist between higher childhood maltreatment scores and poorer PRF in parents, but that this effect is hidden by heterogeneity in study designs, small samples, and a lack of clarity regarding the exact proportion of the study populations that meet criteria for moderate-severe childhood maltreatment history. Alternatively, childhood maltreatment and PRF may be inconsistently associated, or there may be a third variable influencing this relationship that we have not yet identified.

No systematic review has been conducted on this topic for comparison; however, previous studies that have acknowledged inconsistencies in the association between parental childhood maltreatment history and PRF have suggested that one reason for this inconsistency may be over-reliance on language requirements inherent in verbal measures of PRF (Camoirano, 2017). Studies included in the present review all employed verbal (e.g., self-report, interview-based) measures of childhood maltreatment history and PRF. It is therefore possible that the results were biased due to a lack of nonverbal measures of PRF, as per findings regarding parental embodied mentalization (Gagné et al, 2021). Among the verbal PRF measures used, there was no clear distinction between studies that did or did not find a significant association. It is further possible that language requirements may also impact results on the self-report measures of childhood maltreatment (e.g., for parents from linguistically diverse backgrounds), and that the results of the present review should be considered within this context.

Another potential explanation for the inconsistent relationship between a parent's history of childhood maltreatment and their PRF may be that these constructs have different patterns of interaction in clinical versus nonclinical populations (Fonagy & Target, 1997). This does not appear to be supported by evidence within the present study, given that there were both clinical and nonclinical populations in the group that found a significant association between childhood maltreatment and PRF, as well as the group of studies that did not. Of the five studies which excluded parents with current or prior serious mental health issues, three found a nonsignificant association between childhood maltreatment and PRF, while two found a significant relationship for childhood physical abuse only. Of the three studies which excluded caregivers with substance use difficulties, two found a nonsignificant association and one found a significant association for physical abuse only (Moser et al., 2019; also excluded parents with serious mental

health issues). The mixed results therefore do not indicate a clear role of a clinical versus nonclinical population in the pattern of association between childhood maltreatment and PRF.

An additional confounding factor in understanding the role of parent mental health is that only four of the 11 included studies measured and reported the prevalence of mental health symptoms in their population, with mixed findings about the joint versus differential effects of mental health symptoms and childhood maltreatment on PRF (Håkansson et al., 2018; Moser et al., 2019; Newman-Morris et al., 2020; Stacks et al., 2014). The lack of clarity regarding these factors in the research populations is a key finding, because of the possibility of mental health and substance use issues to act as proxies for poor PRF (i.e., a parent who experiences mental illness or substance use is less likely to have capacity for mind-mindedness; Camoirano, 2017; Håkansson et al., 2018). The final point is of considerable note, given that the majority of individuals who experience childhood maltreatment will also experience mental illness in their lifetime (Doyle & Cicchetti, 2017). Despite this, six of the 11 studies in our present review excluded parents with current or prior severe mental illness from analysis.

Factors such as parent gender, study quality, measurement tool used, and analysis type (e.g., correlation versus regression) similarly did not appear to influence whether the study found a significant relationship or not between higher childhood maltreatment scores and poor PRF. Studies did appear to differ slightly in their pattern of results, however, depending on whether they reported the prevalence of childhood maltreatment within the sample or reported on subtype of childhood maltreatment instead of an overall score. The small sample number of studies again did not permit statistical analysis of these hypotheses; therefore, future studies should explore this further once more studies are available for meta-analyses.

The finding that only two of the 11 studies included a measure of childhood attachment in addition to measures of parental history of childhood maltreatment and PRF is of great importance. As mentioned, this area of research was instigated because of the theoretical importance of PRF to foster secure attachment in children of parent survivors to avoid the intergenerational transmission of insecure attachment (Fonagy & Target, 1997). Camoirano (2017) found in their narrative review that, while most studies reported improvements in PRF following mentalization-based interventions, this did not consistently predict secure attachment in children. For example, Sadler et al. (2013) conducted a cluster randomized controlled trial of their PRF intervention program in a community sample of mothers and found no significant differences in improvement of PRF between the intervention group and the control. However, mothers in the intervention group did have significantly more securely attached children (i.e., even though PRF did not statistically improve, attachment of survivor's children did). This finding highlights the importance of continually evaluating PRF and the attachment of children of parent survivors of childhood maltreatment side-by-side, to better understand if PRF is the skill which should be targeted to improve attachment outcomes or if other variables should be targeted. Inconsistencies in the association between parental childhood maltreatment history and attachment status of their children highlight that there are potentially other factors of greater importance in predicting secure attachment. It is crucial to identify these factors to ensure targeted and effective parenting programs in high-risk populations.

As previously stated, some studies which measured child attachment alongside PRF in dedicated samples of parents with

a history of childhood maltreatment were excluded from the present review due to measuring PRF prenatally (Berthelot *et al.*, 2015; Ensink *et al.*, 2017). These two excluded studies found significantly lower PRF in mothers with a history of childhood maltreatment, and that mothers with poorer PRF were more likely to have children with insecure attachment. Due to the limited sample size, however, it is not possible to draw inferences between prenatally and postnatally measured PRF and their relationship with parental history of childhood maltreatment and child attachment. As mentioned above, these studies were excluded due to prior research which indicates that PRF can change significantly and rapidly after the birth of a child (Amos *et al.*, 2015; Chamberlain, Gee, Brown, *et al.*, 2019), and that prenatal and postnatal PRF can not only predict different outcomes but consist of different substructures (Smaling *et al.*, 2016). Another potential explanation for inconsistent findings in the present systematic review may therefore also be due to different components of PRF being reported upon (e.g., certainty domain of PRF as reported in Milan *et al.*, 2020).

Without a clear understanding of the association between childhood maltreatment and PRF, it is not possible or useful to examine the potential moderating role of PRF (or other modifiable factors) between parental history of childhood maltreatment and insecure attachment of survivors' children. It may be that other factors relating to the experience of becoming a parent are more important in determining whether intergenerational trauma is perpetuated (e.g., Piccini, 2021). However, it would appear premature to disregard PRF as a candidate mechanism without addressing important inconsistencies in research in this area. Key inconsistencies identified in the present review which may influence inconsistent results include: level of childhood maltreatment reported, language-based measurements of PRF, a lack of reporting sample size of maltreated parents within the greater study population, and including participants with mental health difficulties as this is representative of the true population of parents with a history of childhood maltreatment.

Further, no study in the present review examined the role of timing of childhood maltreatment on the association between childhood maltreatment scores and PRF. This is of note, given that childhood maltreatment is a research topic due to the established importance of traumatic events during the 'sensitive' periods of development (e.g., Teicher & Samson, 2016). The mixed findings regarding the association between parental history of childhood maltreatment and PRF are an important contribution to literature in this area, especially considering that PRF-based parenting interventions are widely, and by many accounts, effectively employed (Camoirano, 2017).

The results of this review should be considered within the context of limitations of the included studies. There was substantial heterogeneity in most aspects of study design (e.g., populations, sample sizes, measures). However, these inconsistencies provide an important base for future research. Future studies will allow for the potential of meta-analysis if they use measures of childhood maltreatment which capture type, timing, and frequency (and report on each aspect); report the exact proportion of participants with a history of childhood maltreatment (and the cutoffs used to determine this); explain why variations of established measures were used (e.g., the Parental Development Interview); report on all subdomains of PRF; include parents with mental illness to have a representative sample of childhood maltreatment survivors; and include validated measurements of childhood attachment alongside those of childhood maltreatment and PRF (ideally comparing

postnatal and prenatal samples). Findings from the present study have also shown the need for structural exploration of the mediating or moderating effects of various confounding factors, including mental health. Further, future studies are strongly encouraged to incorporate nonverbal measures of PRF, such as parental embodied mentalization (Afek *et al.*, 2022), to ensure that this skill is accurately captured and mechanisms further understood.

Finally, there is a severe lack of representation of fathers in this literature, and no representation of Indigenous families who have been shown to be disproportionality effected by intergenerational trauma (Chamberlain *et al.*, 2022).

Conclusion

Intergenerational trauma is a pervasive societal issue that creates significant economic, psychological, and medical burden (Chamberlain, Gee, Harfield, *et al.*, 2019). The mechanisms which perpetuate the intergenerational transmission of trauma consequences remain poorly understood, although PRF has been suggested as a candidate and is incorporated into current interventions. Findings from this systematic review have shown mixed evidence for an association between a parent's history of childhood maltreatment and later PRF, however, this should be interpreted within the context of extreme heterogeneity of included studies. A very important finding is that many studies excluded parents with current or previous serious mental health issues, despite the reality that a significant proportion of survivors of childhood maltreatment report mental health issues. The present review was not able to comment on the role of PRF in the intergenerational transmission of insecure attachment, due to the quality and current availability of evidence. Future studies should adopt lessons from the present review to facilitate replicable research and more in-depth systematic analyses in the future that would lend themselves to meta-analysis. Should PRF be conclusively excluded as a candidate mechanism in intergenerational trauma (either in clinical, nonclinical populations, or both), other candidate mechanisms should be emphasized and current parenting programs employing PRF re-examined. We hope that future research will assist in answering these questions.

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Conflicts of interest. None.

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