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Interventions for children who have experienced physical abuse: A systematic review narrative synthesis

Kirsten Pearson, Danielle Stephens-Lewis, Kimberley Schenke

Aim: Physical abuse has been linked to poor mental and physical health in adulthood, more recently findings have suggested that these effects can be present in children as young as three. Though these effects are known, research exploring interventions specifically for children who have experienced physical abuse is scarce. The current systematic review uses a narrative synthesis approach to examine studies which reported on interventions for children who have experienced physical abuse.

Method: A number of databases were searched, and studies were selected based on hierarchical criteria. This systematic review used a narrative synthesis approach to evaluate the interventions involved in the studies selected. Results: There were 17 studies included in this review, each of the studies reported improvements in at least one of the necessary outcome areas evaluated which included: behavioural, cognitive, and socio-emotional outcomes.

Conclusion: Overall efficacy of interventions was not able to be determined due to the heterogeneity of the studies, however theoretical underpinnings and successful components of interventions are discussed in this review. Limitations and recommendations for the future are also addressed.

1.1 Introduction

Early childhood experiences are linked with the development of secure relationships (Ainsworth et al., 1978; Bowlby, 1973; Ein-Dor & Hirschberger, 2016; Fearon & Roisman, 2017; Sprang, 2009). Negative/traumatic experiences during childhood have been found to be detrimental to relationship formation, with both mental (e.g., depression, anxiety) and physical health implications (e.g., cancer, liver disease; Boullier & Blair, 2018; Copeland et al., 2007; Felitti et al. 1998; Simmons et al., 2009; Sprang, 2009). Adverse Childhood Experiences (ACEs) are conceptualised as traumatic experiences encountered during childhood; including family bereavement, suicide, or imprisonment, as well as witnessing or experiencing domestic abuse or violence in one's community (Berg, et al., 2018; Boullier & Blair, 2018; Felitti et al., 1998). Understanding such adverse experiences is important given their association with poor physical and mental health outcomes in adulthood (Briere & Elliot, 2003; Burke et al., 2011; Felitti et al., 1998; Springer et al., 2003; Springer et al., 2007). For example, exposure to four or more ACEs is associated with increased risk of hazardous substance use, depression, and obesity in adulthood (Boullier & Blair, 2018; Felitti et al., 1998; Garrido et al., 2018; Gilbert et al., 2015; Kalmakis & Chandler, 2014). Additionally, exposure to at least one ACE nearly doubles the risk of poor overall health in children as young as three (Flaherty et al., 2006; Kerker et al., 2015). However, there is currently limited evidence on the efficacy of treatment and care for children and young people who have experienced ACEs (Lewis, 2019; Springer et al., 2007), and no evidence-based framework informing best practice for therapy with children (Lewis, 2019; Raghavan & Alexandrova, 2014; Springer et al., 2007).

Physical abuse is one ACE requiring further consideration, having been linked to an increased risk of mental (Flaherty et al., 2006; Flaherty et al., 2009; Ip et al., 2016; Kaplan et al., 1998; Rode et al., 2019; Springer et al., 2007) and physical (Springer et al., 2003; Springer et al., 2007; Hager & Runtz, 2012) health concerns in adolescents and adults and high-risk behaviours (e.g., drug use or smoking). Importantly, these can still be present 40 years after the abuse occurred (Springer et al., 2007). Yet most current interventions relating to abuse focus on childhood sexual abuse (CSA, Briere & Elliot, 2003; Springer et al., 2007), overlooking the complex implications associated with other forms of abuse (Kiser et al., 2014; Petrenko et al., 2012). This is particularly problematic for the rarity for one type of abuse to occur in isolation (Springer et al., 2007). Resultantly, nuanced and tailored responses to the complex interplay between abuse and psychological outcomes, remains limited (Frost & Dolan, 2021; Springer et al., 2007).

Whilst consideration of multiple ACEs is seen in adult treatments, where referrals to Trauma-Focused therapies or posttraumatic stress disorder (PTSD)-focused therapies are common (Finkelhor, 2018), this is lacking in the treatment of children. This review will focus on the lesser-researched area of interventions into non-sexual physical abuse (i.e., instances in which a person is violent/aggressive toward another person resulting in injury - including instances where an individual contrives symptoms of, or intentionally causes, an illness in another individual; National Society of Prevention of Cruelty to Children, 2022). Albeit limited, some research has explored the impact of physical abuse on children and adolescents, finding an association with substance use, low self-esteem, anxiety, depression, and PTSD (Kobulsky et al. 2016; Tonmyr et al., 2010; Adams et al., 2018; Flaherty et al., 2009), which can cause serious issues in an individual's life (Flaherty et al., 2006; Flaherty et al., 2009; Ip et al., 2016; Kaplan et al., 1998; Rode et al., 2019; Springer et al., 2007). However, there is limited evidence on the efficacy of treatment and care for children around both physical abuse and multiple ACEs (Lewis, 2019; Springer et al., 2007).

Typically, interventions for childhood physical abuse are either attachment-based or involve trauma-focused cognitive behavioural therapy (Allen, 2012; Black et al., 2012; Cohen et al., 2006; Cohen & Mannarino, 2008; Sprang, 2009). Attachment-based therapies (stemming from Bowlby's, 1969, attachment theory) are based on evidence that such children typically develop insecure attachments with caregivers, resulting in maladaptive behaviours (Crittenden, 1992; Parish-Plass, 2008), and, therefore, aim to improve the relationship with the caregiver (Parish-Plass, 2008). Whilst such interventions can help to repair and build relationships, they fail to address behavioural management or cognitive concerns (Diamond et al., 2016). Alternatively, Trauma-Focused Cognitive Behavioural Therapy (TF-CBT; Black et al., 2012; Cohen & Mannarino, 2008; Thornback & Muller, 2015), is primarily focused on changing thoughts and behaviours in alleviating aversive psychological symptoms (Black et al., 2012). However, this therapy does not always include the caregiver, which is an important step in repairing and building healthy relationships (Cohen et al., 2006; Cohen & Mannarino, 2008). Whilst these two therapies take markedly different approaches, there is little research exploring their efficacy for children who have experienced physical abuse. There is some evidence that attachment-based therapies may be more effective for younger children because of their increased dependence on primary caregivers (Zilberstein, 2014). However, conclusive evidence is lacking given the amount of variation within the two intervention types themselves (Becker et al., 2004; Cohen & Mannarino, 2008). Thus, this

review aims to synthesise and examine current evidence relating to interventions for children who have experienced physical abuse. Specifically, it aims to:

- Determine the efficacy of current interventions for children who have experienced physical abuse,
- Determine promising therapeutic approaches addressing behavioural, cognitive and socio-emotional needs specific to experiencing physical abuse

2.1 Methods

This review (PROSPERO Registration number: CRD42021248576) was completed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement (PRISMA; Page et al., 2021). Subsequently, a narrative synthesis assessed the efficacy of the interventions was completed (Popay et al., 2006).

2.1.1 Search strategy

The search strategy was developed in line with the Cochrane Handbook for Systematic Reviews of Interventions (Higgins et al., 2019). The Handbook suggests using Population, Intervention, Comparison(s), and Outcome, or PICO, as a guideline to inform the eligibility criteria which then informed the search strategy (Higgins et al., 2019). To develop the search strategy, the eligibility criteria was determined, then following the PICO guideline the keywords for the search were defined. The keywords were as follows: 'treatment' OR 'therapy' OR 'intervention' and 'child physical abuse' OR 'child abuse' OR 'child maltreatment.' As research often uses the terms 'child abuse' or 'child maltreatment' to include multiple forms of abuse, including physical abuse, these keywords were determined to be appropriate for the search.

The following databases were searched through the University of Gloucestershire's Library Discover : PsychINFO (1806 to present); National Institute for Health Research (NIHR) for ongoing studies/trials; The Cochrane Central Register of Controlled Trials (2000 to present); Elsevier ScienceDirect Journals, University of Gloucestershire Library Discovery; WorldCat.org; Wiley Online Library; WorldCat; MEDLINE; ArticleFirst; SpringerLink; Electronic Collections Online; Education Resources Information Center (ERIC); Electronic Books; OAlster; ABI/INFORM Global; ScienceDirect; WorldCat Dissertations and Theses; Emerald Group Publishing Limited; SAGE Journals; Directory of Open Access Journals, ProceedingsFirst, Oxford Journals, PapersFirst, GPO Monthly Catalog, JSTOR Biological Sciences Collection; ACM Digital Library; Oxford Art Online; Humanities International Complete; Walter de Gruyter eJournals; JSTOR Arts & Sciences V Collection; Business Source Complete; SocINDEX with Full Text (1881 to present); CINAHL with Full Text (1964 to present); APA PsycArticles; Psychology and Behavioral Sciences Collection (1943 to present). Citations were managed using Endnote software.

2.1.2 Inclusion criteria

No start date or language restrictions were specified. Hierarchical inclusion criteria (Higgins et al., 2019) were:

- (1) Studies include children, 0-18 years old, who have experienced physical abuse/neglect/maltreatment/domestic violence (where physical abuse is reported within).
- (2) Studies are either an RCT, CT, intervention Study, case study, or pre-post design.
- (3) Studies include at least one of the following outcome measures: Behaviours, Social-emotional, Cognitive functioning.

Posttraumatic stress disorder (PTSD) was not considered as an outcome area for this review due to the overreliance of a PTSD diagnosis in assessing trauma and abuse. Literature suggests that only about 10% of children who are exposed to potentially traumatic experiences receive a PTSD diagnosis (Fariba & Gupta, 2023).

Following a preliminary search, accessibility of the article was added as a fourth requirement. This requirement was added to specify that the full article needed to be accessible to the researchers.

2.1.3 Screening, Inclusion and Data extraction

Primary and secondary screening were completed by K.P. and D.S.-L. (discrepancies were resolved by K.S.). K.P. extracted data (on the study aims, methodology, participants, data collection and analysis and strengths and limitations) into a custom spreadsheet in Microsoft Excel.

2.1.4 Data synthesis

A narrative synthesis was conducted due to insufficient raw data for meta-analysis (Popay, et al., 2006). Synthesis followed the steps recommended by Popay et al.: (1) a preliminary synthesis, (2) exploration of relationships, and (3) assessment of the robustness of the synthesis. The Theory of Change step was omitted due to the varied theoretical underpinnings of the interventions (Popay, et al., 2006). Preliminary synthesis (by K. P.) summarised each study (by population characteristics, intervention characteristics, study design, and outcomes), and investigated patterns across studies. Factors that might explain differences in effects across the included studies were considered. Finally, robustness was assessed (by K.P.) to determine the trustworthiness (and robustness) of the methodological quality of the studies, and of the synthesis process itself.

2.1.5 Assessment of risk of bias and robustness of studies

Given variation in study designs, four quality assessment tools were used (see Table 1). An adapted version of the Cochrane's risk of bias (Higgins et al., 2019) categorised seven studies (Carrion et al. 2013; Dauber et al. 2015; Farkas et al. 2010; Konanur et al. 2015; McCullough & Mathura 2019; Purvis et al. 2015; Taussig & Culhane 2010) into low, high, or unclear risk of bias. This assessed random sequence generation, allocation concealment, secretive outcome reporting, and incomplete data.

A checklist for quasi-experimental designs (Joanna Briggs Institute; 2020) was used for one study (Mueller & McCullough, 2017); assessing variables studied, comparisons between participants, use of a control group, outcome measures, follow-up procedures, and appropriateness of the statistical analysis.

A checklist for case reports (JBI, 2020) assessed two studies (Lawson & Hight, 2015; Purvis et al., 2014), considering patient's demographic characteristics, history and current clinical condition, diagnostic tests/assessments, intervention procedure, post-intervention clinical condition, adverse events, and takeaway lessons.

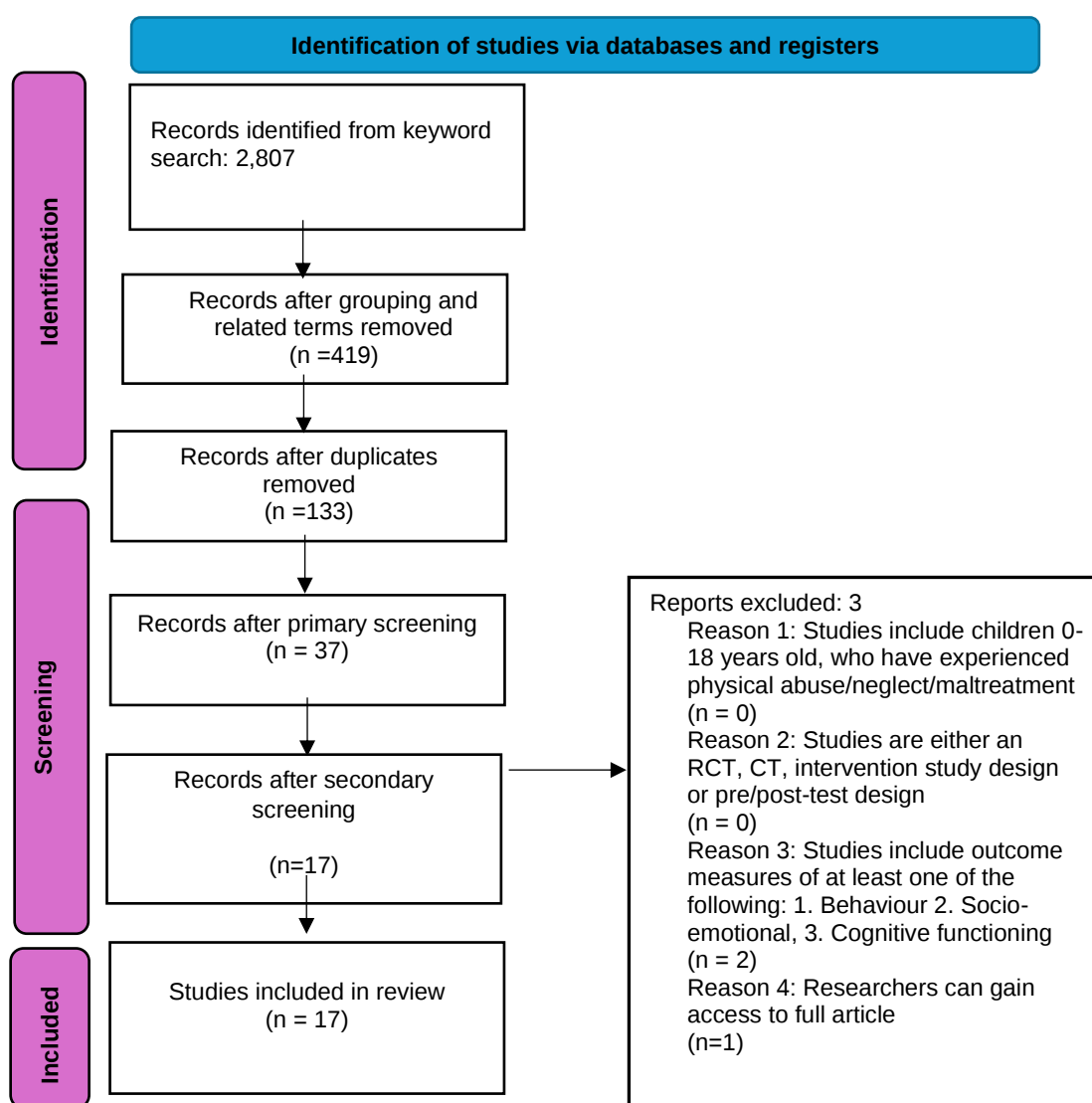
Finally, a checklist for cross-sectional studies (JBI, 2020) was determined to be the most appropriate tool for three studies (Barker & Place, 2005; Callaghan et al., 2019; Norton et al., 2017), given the relevance of the items on the checklist.

3.1 Results

3.1.1 Summary of search results

Initial searches found 2,807 articles, however, removal of grouping related terms left 419 articles, removal of duplicates left 133 for primary screening (Figure 1). Subsequently, 37 met primary screening criteria and 17 met secondary criteria, leading to 17 articles being included in the review. Figure 1 shows the PRISMA results.

Figure 1. PRISMA flow diagram



3.1.2 Characteristics of studies included

Seventeen studies with eleven study designs were included. Four Randomized Controlled Trials (RCTs; Carrion et al., 2013; Konanur et al., 2015; Farkas et al., 2010; Taussig &

Culhane, 2010); one comparison model (McCullough & Mathura, 2019); three mixed methods design (Barker & Place, 2005; Callaghan et al., 2019; Norton et al., 2017); two intervention studies (Barker & Place, 2005; Beltran et al., 2016); one pilot study (Huang-Storms, 2007); two case studies (Lawson & Hight, 2015; Purvis et al., 2014); one single case design (Feather & Ronan, 2009); three pre-test, post-test design's (Dauber, et al., 2015; Lawson & Hight, 2015; Purvis et al., 2015); and one quasi-experimental design (Meuller & McCullough, 2017).

3.1.3 Quality assessment

Table I reports on Risk of bias. One article scored high risk for random sequence generation and allocation concealment (McCullough & Mathura, 2019). Risk of bias could not be determined for articles, which lacked detailed, explicit information (Carrion et al., 2013; Dauber et al., 2015; Farkas et al., 2010; Konanur et al., 2015; McCullough & Mathura, 2019; Purvis et al., 2015; Taussig & Culhane, 2010).

Risk of bias could not be determined for 10 studies as the included Joanna Briggs Institute checklists (Checklist for Quasi-experimental designs; Checklist for Case Report Studies; Checklist for Analytical Cross-sectional studies; JBI, 2020) assessed the quality of the study rather than the risk of bias. Table II reports on quality assessment tools utilised.

All studies were determined to have the necessary information to be included in this review.

Table I. Summary of Risk of Bias results using the Cochrane risk-of-bias tool (RoB2)

Article Author and year	Random sequence generation?	Allocation concealment?	Were baseline outcome measurements similar?	Were baseline characteristics similar?	Were incomplete outcome data adequately addressed?	Was knowledge of the allocated interventions adequately prevented during the study?	Was the study adequately protected against contamination?	Was the study free from selective outcome reporting?
Carrion et al. (2013)	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear	Low risk	Low risk
Dauber et al. (2015)	N/A	N/A	Low risk	Low risk	Unclear	N/A	N/A	High risk
Farkas et al. (2010)	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear	Unclear	Low risk
Konanur et al. (2015)	Low risk	Low risk	Low risk	Low risk	Unclear	Unclear	Unclear	N/A
McCullough and Matura (2019)	High risk	High risk	Low risk	Low risk	Unclear	Unclear	Unclear	Low risk
Purvis et al. (2015)	Low risk	Low risk	Low risk	Low risk	Unclear	Low risk	Low risk	High risk
Taussig and Culhane (2010)	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear	Low risk	Low risk

Table II. Quality Appraisal Tools and Accompanying Study Design

Quality Appraisal tool	Cochrane Risk of Bias tool	Joanna Briggs Institute Checklist for Quasi-experimental design	Joanna Briggs Institute Checklist for Case Reports	Joanna Briggs institute Checklist for Analytical Cross-Sectional studies
Study design:	RCT and RCT waitlist control:	Quasi-experimental design:	Case Study:	Mixed Methods:
authors (year)	Carrion et al. (2013)	Mueller and McCullough (2017)	Purvis et al. (2014)	Norton et al. (2017)
	Farkas et al. (2010)		Lawson and Hight (2015)	Barker and Place (2005)
	Konanur et al. (2015)			Callaghan et al. (2019)
	Pre-test, post-test design:			Intervention Study:
	Dauber et al. (2015)			Beltran et al. (2016)
	Purvis et al. (2015)			Other Intervention model:
	Taussig and Culhane (2010)			Parish et al. (1985)
	Comparison Model:			Pilot Study:
	McCullough and Mathura (2019)			Huang-Storms et al. (2007)
				Single Case Design:
				Feather and Ronan (2009)

3.2 Population characteristics

3.2.1 Abuse type.

Whilst all studies included physical abuse, only one study included physical abuse alone (Parish et al., 1985). Twelve studies included populations who experienced physical abuse, sexual abuse, neglect, and emotional abuse (Barker & Place, 2005; Beltran et al., 2016; Carrion et al., 2013; Dauber et al., 2015; Farkas et al., 2010; Feather & Ronan, 2009; Konanur et al., 2015; Lawson & Hight, 2015; McCullough & Mathura, 2019; Meuller & McCullough, 2017; Purvis et al., 2014; Purvis et al., 2015). One study included sexual abuse, physical abuse and neglect (Norton et al., 2017), another included participants who also experienced or witnessed domestic violence (Callaghan et al., 2019), and a final included maltreatment (Taussig & Culhane, 2010).

3.2.2 Gender and age.

Two studies included females (Lawson & Hight, 2015; Purvis et al., 2014); one included males (Beltran et al., 2016); one did not report sex (Taussig & Culhane, 2010); the remaining studies included both females and males. One study consisted of a single 19-year-old (Callaghan et al., 2018), whereas all other studies reported participants aged under 18.

3.2.3 Exclusion/Inclusion criteria and diagnoses.

Four studies excluded participants with moderate or severe learning disabilities, or developmental delays (Carrion et al., 2013; Farkas et al., 2010; McCullough & Mathura, 2019; Taussig & Culhane, 2010). One study excluded individuals with psychosis, a psychotic disorder, or suicidality (Farkas et al., 2010), and one study excluded those with schizophrenia or who were not proficient in English (Carrion et al. 2013).

All participants within Beltran et al. (2016) were diagnosed with Attention Deficit Hyperactive Disorder and Adjustment Disorder (60% were also diagnosed with Oppositional Defiant Disorder). All participants within Huang-Storms et al. (2007) were diagnosed with Reactive Attachment Disorder, and all participants in Feather & Ronan (2009) were diagnosed with PTSD. The remaining 14 studies did not specify any diagnostic inclusion criteria (Barker & Place, 2005; Callaghan et al., 2019; Carrion et al., 2013; Dauber et al., 2015; Farkas et al., 2010; Konanur et al., 2015; Lawson & Hight, 2015; McCullough & Mathura, 2019; Mueller & McCullough, 2017; Norton et al., 2017; Parish et al., 1985; Purvis et al., 2014; Purvis et al., 2015; Taussig & Culhane, 2010).

3.3 Intervention characteristics

All interventions were delivered face-to-face, with variation in the number of sessions provided. Four studies determined session numbers on a case-by-case basis (Barker & Place, 2005; Dauber et al., 2015; Feather & Ronan, 2009; Parish et al., 1985). Eight studies administered 10 sessions (Beltran et al., 2016; Carrion et al., 2013; Dauber et al., 2015; Farkas et al., 2010; Feather & Ronan, 2009; Huang-Storms et al., 2007; McCullough & Mathura, 2019; Mueller & McCullough, 2017). One study reported a 17-month long intervention (Lawson & Hight, 2015), and one reported a 9-month intervention (Taussig & Culhane, 2010), but neither reported the number of sessions included.

McCullough and Mathura (2019) evaluated an intervention rooted in biology and physiology, drawing from Theraplay and Dyadic Developmental psychotherapy. Three interventions were rooted in TF-CBT (Feather & Ronan, 2009; Lawson & Hight, 2015; Konanur et al., 2015), with another including elements of CBT emphasising Psychotherapy; incorporating therapeutic play with younger children (Barker & Place, 2005). One intervention was trauma-focused; employing a treatment guided by the adaptive information processing model rather than CBT (Farkas et al., 2010). One TF-CBT intervention (Lawson & Hight, 2015) incorporated principles of Attachment, Self-Regulation, Competency framework and Integrated Treatment of Complex Trauma. Three interventions included Trauma-Informed therapy; one of these included TF-CBT for maltreated children diagnosed with PTSD (Norton et al., 2017), one involved a training intervention training the parents of children who had experienced abuse (Purvis et al., 2015), and one included an intervention addressing various subsystems (Purvis et al., 2014). One study used a manualised cue-centred treatment, described as an integrated approach rooted in psychoeducation (Carrion et al., 2013). Three interventions were attachment-based (Dauber et al., 2015; Purvis et al., 2014; Purvis et al., 2015), with Purvis et al. (2015) training parents in their Trust-Based Relational Intervention. One study incorporated yoga with psychotherapy (Beltran et al., 2016). One study reported on the MPOWER intervention, incorporating a narrative systematic approach (Callaghan et al., 2019). One study consisted of an intervention based on neurofeedback using audio and visual feedback (Haung-Storms et al., 2007), and one study incorporated animal-assisted therapy (equine-facilitated psychotherapy; Mueller & McCullough, 2017). Table 3 provides details of the studies.

Table III. A detailed summary of the studies included

Author and study design	Intervention or program	Theoretical Approach	Method of collection	Sample Age (years)	Changes in outcome area		
					Behaviour	Cognitive	Socio-Emotional
Parish et al. (1985) Other Intervention Model	Family Development Centre Program	Program which emphasises development and involves child and parent interaction	Clinical report	2.5 to 5			X
Norton et al. (2017) Mixed-Methods design	Family Enrichment Adventure Therapy	Trauma-Informed therapy	Focus group Trauma Symptom Checklist for Children, Family Assessment Device	8 to 17	X	X	X
Barker & Place (2005) Mixed-Methods design	Sunrise Project	Rogerian style with CBT	Semi-structured interview, Health of the Nation Outcome Scales	4 to 18	X	X	X
Callaghan et al. (2019) Mixed-Methods design	MPOWER	Narrative systemic approach and creative therapeutic methods	Semi-structured interview, The Children's Outcome Rating Scale, The Children's Group Session Rating Scale	11 to 18	X		X
Beltran et al. (2016) Intervention study	Yoga-based psychotherapy group (YBPG)	Psychotherapy with Yoga	Structured Clinical Interview for DSM Disorders, Childhood Version, Behavioural and Emotional	8 to 12		X	X

Rating Scale-2 nd Edition							
Huang-Storms et al. (2007)	qEEG-guided Neurofeedback	Neurofeedback	Test of Variables of Attention, Child Behavior Checklist,	6 to 15.5	X	X	X
Pilot Study							
Feather & Ronan (2009)	Trauma-Focused CBT program	Trauma-Focused CBT	Child Behavior Checklist, Anxiety Disorder Interview Schedule for Children, Coping Questionnaire, Children's Post-traumatic Stress Reaction Index, State Trait Anxiety Inventory for Children, Children's Depression Inventory	9 to 13	X	X	
Single Case design							
Purvis et al. (2014)	Trust-Based Relational Intervention (TBRI)	Trauma-Informed therapy and Attachment-based intervention	Neurochemical levels and observation from facility	16	X	X	X
Case Study							
Lawson & Hight (2015)		Trauma-focused CBT for Complex Trauma	Trauma Symptom Checklist for Children, Clinical interview, The Eyberg Child Behavior Inventory, The UCLA PTSD Reaction Index for <i>DSM-IV</i> , The Youth Outcome Questionnaire Self-Report	9	X	X	X
Case study, Pre-test, post-test design							
Dauber et al. (2015)	Trauma Recovery Program	Attachment-based CBT, creative arts approaches and incorporated other research supported interventions	Trauma Symptom Checklist for Children, Clinical Interview	8 to 17	X	X	
Pre-test, post-test design							

Purvis et al. (2015)	Trust-Based Relational Intervention	Trauma-Informed therapy and Attachment-based intervention	Trauma Symptom Checklist for Young Children, Strengths and Difficulties Questionnaire	5 to 12	X	X	
Pre-test, post-test design							
Mueller & McCullough (2017)	Equine-facilitated psychotherapy	Animal assisted therapy	Revised Child Impact of Events scale-13 (CRIES-13), Human-Animal Bond scale	10 to 18	X	X	
Quasi-experimental trial							
Taussig & Culhane (2010)	Fostering Healthy Futures	Mentoring and skills groups	Child Behavior Checklist, Trauma Symptom Checklist for Children, Life Satisfaction Survey, The Coping Inventory, The Social Acceptance and Global Self-Worth scales, The Self-Perception Profile for Children, Social Support Factor Score based on factor analysis of The People in My Life- Short Form	9 to 11	X	X	X
RCT							
Farkas et al. (2010)	MASTR/EMDR	Motivation-adaptive skills-trauma resolution, Eye Movement Desensitization and Reprocessing	Child Behavior Checklist, Trauma Symptom Checklist for Children, Semi-Structured Interview	13 to 17	X	X	
RCT							
Carrion et al., (2013)	Cue-Centered Treatment	Psychoeducation	The UCLA PTSD Reaction Index for DSM-IV-Child Version, The revised Children's Manifest Anxiety Scale, The Children's Depression Inventory, The	8 to 17		X	
Randomised waitlist-control trial							

			Violence Exposure Scale for Children-Revised, The UCLA Reaction Index or DSM-IV-Parent version, The Beck Anxiety Inventory, The Children's Global Assessment Scale				
Konanur et al. (2015)	Healthy Coping Program	Trauma-focused CBT	Trauma Symptom Checklist for Children, Trauma Symptom Checklist for Young Children	6 to 12	X	X	
Randomised waitlist-control trial							
McCullough & Mathura (2019)	Neurophysiological Psychotherapy	Combining biology and physiology. Drawing on Theraplay and Dyadic Developmental Psychotherapy	Behaviour Rating Inventory of Executive Functioning Assessment Checklist for Children or Adolescents, Child Behavior Checklist, Parent Interview	9 to 11	X	X	X
Comparison model							

3.4 Outcomes Measures

3.4.1 Caregivers

Interviews with caregivers were completed in three studies (Barker & Place, 2005; Farkas et al., 2010; Konanur et al., 2015). Caregivers reported some outcomes for 11 studies (Barker & Place, 2005; Beltran et al., 2016; Carrion et al., 2013; Farkas et al., 2010; Feather & Ronan, 2009; Huang-Storms et al., 2007; Konanur et al., 2015; Lawson & Hight, 2015; McCullough & Mathura, 2019; Norton et al., 2017; Taussig & Culhane, 2010), and all outcomes for one study (Purvis et al., 2015).

The Trauma Symptom Checklist for Children or Young Children was completed by the caregiver in two studies (Purvis et al., 2015; Konanur et al., 2015). Five studies used the Child Behaviour Checklist parent form (Farkas et al., 2010; Feather & Ronan, 2009; Huang-Storms et al., 2007; McCullough & Mathura, 2019; Taussig & Culhane, 2010). The Behaviour Rating Inventory of Executive Functioning was reported for one study (McCullough & Mathura, 2019). The UCLA PTSD Reaction Index for DSM-IV-Parent version, Beck Anxiety Inventory and Beck Depression Inventory were all reported in one study

(Carrion et al., 2013). The Eyberg Child Inventory was used in one study (Lawson & Hight, 2015).

3.4.2 Teachers

Teacher reports were used for three studies (McCullough & Mathura, 2019; Parish et al., 1985; Taussig & Culhane, 2010). One study included reports on the Learning Accomplishment Profile by special education teachers (Parish et al., 1985). One study also used the Child Behaviour Checklist teacher form (Feather & Ronan, 2009), with another using The Teacher Report Form (Taussig & Culhane, 2010).

3.4.3 Children

Ten studies employed child-reported measures (Barker & Place, 2005; Beltran et al., 2016; Carrion et al., 2013; Dauber et al., 2015; Farkas et al., 2010; Feather & Ronan, 2009; Haung-Storms et al., 2007; Konanur et al., 2015; Lawson & Hight, 2015; McCullough & Mathura, 2019), with one only adopting child reports (Callaghan et al., 2019). Interviews with children were completed in seven studies (Beltran et al., 2016; Barker & Place, 2005; Callaghan et al., 2019; Dauber et al., 2015; Farkas et al., 2010; Feather & Ronan, 2009; Konanur et al., 2015). The Trauma Symptom Checklist for Children was completed by the child in five studies (Dauber et al., 2015; Farkas et al., 2010; Lawson & Hight, 2015; Taussig & Culhane, 2010; Norton et al., 2017). One study (Taussig & Culhane, 2010) used The Coping Skills Inventory, the Social Acceptance and Global Self Worth Scales, the Self-Perception Profile for Children, and the Social Support Factor Score. The Assessment Checklist for Children and The Assessment Checklist for Adolescents were used for one study (McCullough & Mathura, 2019). One study used the UCLA PTSD Reaction Index for *DSM-IV*-Child Version, The Revised Children's Manifest Anxiety Scale, The Children's Depression Inventory, and The Violence Exposure Scale for Children-Revised (Carrion et al., 2013). The Youth Outcome Questionnaire-Self Report was used in one study (Lawson & Hight, 2015). Feather and Ronan (2009) used child report measures including, the Anxiety Disorder Interview Schedule for Children, Coping questionnaire, Children's Post-traumatic Stress Reaction Index, State Trait Anxiety Inventory for Children, and Children's Depression Inventory.

3.4.4 Clinicians

One study only used clinical reports (Mueller & McCullough, 2017), while eight studies used clinician reports for some outcomes (Barker & Place, 2005; Beltran et al., 2016; Dauber et al., 2015; Farkas et al., 2010; Feather & Ronan, 2009; Haung-Storms et al., 2007; Konanur et al., 2015; Lawson & Hight, 2015). One study used reports from residential treatment centre staff (Purvis et al., 2014).

One study used the Test of Variables of Attention (Huang-Storm et al., 2007). The Child and Adolescent Needs and Strengths scale, the UCLA PTSD Reaction Index for *DSM-IV* and Therapy Process Observational Coding System for Child Psychotherapy Alliance Scale were used in one study (Lawson & Hight, 2015).

3.4.5 Families

Lawson and Hight (2015) held a clinical interview with the patient and the patient's mother. A focus group for the families was conducted in one study (Norton et al., 2017).

Efficacy of interventions

The inclusion criteria for this review required studies to report outcomes in at least one of the following areas: behavioural, social-emotional, or cognitive functioning. All studies individually reported effective results in at least one of the outcome areas.

3.4.6 Behavioural

Eleven studies reported improvements in behaviour (Barker & Place, 2005; Farkas et al., 2010; Feather & Ronan, 2009; Huang-Storms et al., 2007; Konanur et al., 2015; Lawson & Hight, 2015; McCullough & Mathura, 2019; Norton et al., 2017; Purvis et al., 2014; Purvis et al., 2015; Taussig & Culhane, 2010). McCullough and Mathura (2019) reported significant improvements in behaviours; classed as Total Problems and Externalizing behavioural difficulties. Three studies also reported significant improvements for their treatment groups in Externalizing Difficulties (Farkas et al., 2010; Huang-Storms et al., 2007; Taussig & Culhane, 2010). However, Feather and Ronan (2009) reported inconsistent results on the Child Behaviour Checklist. Huang-Storms et al. (2007) reported a significant improvement on behavioural outcomes. Farkas et al. (2010) was the only study to provide a follow-up measure on the Child Behaviour Checklist, which showed that reductions in Externalizing behavioural difficulties were maintained after three months. Purvis et al. (2014) also conducted a follow-up report of behavioural differences, with the residential treatment staff reporting that necessary restraint of the participant dropped from 63 times to 15 times in the six months following intervention, suggesting effectiveness in reducing severe maladaptive behaviours which resulted in being restrained.

3.4.7 Cognitive

Eleven studies reported improvements in cognitive functioning (Barker & Place, 2005; Beltran et al., 2016; Carrion et al., 2013; Feather & Ronan, 2009; Huang-Storms et al., 2007; Lawson & Hight, 2015; McCullough & Mathura, 2019; Norton et al., 2017; Purvis et al., 2014; Purvis et al., 2015; Taussig & Culhane, 2010). Seven studies reported significant decreases in areas measured by the Trauma Symptoms Checklist for Children (Dauber et al., 2015; Farkas et al., 2010; Konanur et al., 2015; Lawson & Hight, 2015; Norton et al., 2017; Purvis et al., 2015; Taussig & Culhane, 2010). Lawson and Hight (2015) reported a significant decrease in anxiety and depression, which were maintained during the 12-month follow-up (for the single participant within this study). Farkas et al. (2010) also reported a significant decrease in depression symptoms, stress, anger, dissociation, anxiety, and sexual concerns. The effect sizes here were large suggesting that Motivation-adaptive skills-trauma resolution, Eye Movement Desensitization and Reprocessing were very effective in treating these symptoms. Whilst Mueller and McCullough (2017) found a significant decrease in self-reported intrusion, avoidance, and arousal symptoms (which were associated with post-traumatic stress), there were no differences between the control group and the intervention group suggesting a similar level of effectiveness for Equine-Facilitated Psychotherapy and regular Trauma-Focused CBT.

3.4.8 Socio-emotional

Ten interventions reported significant improvements for a range of socio-emotional aspects (Parish et al., 1985; McCullough & Mathura, 2019; Taussig & Culhane, 2010; Norton et al., 2017; Barker & Place, 2005; Beltran et al., 2016; Callaghan et al., 2019; Huang-Storm et al., 2007; Purvis et al., 2014; Lawson & Hight, 2015). Norton et al. (2017) reported improvements in areas of communication, problem-solving, and closeness, as well as effectiveness in decreasing depression and anxiety symptoms. These results show that Adventure Therapy (rooted in Trauma-informed therapy), can be effective at treating socio-emotional issues within family relationships. One study reported an overall improvement in language skills (Parish et al., 1985). One study reported improvement in psychosocial functioning and participants feeling more comfortable sharing with others (Beltran et al., 2016). Barker and Place (2005) and McCullough and Matura (2019) reported improved peer relationships and indicators for longer-term social inclusion (McCullough & Matura, 2019). One study reported higher perceived social support in their intervention group (Taussig & Culhane, 2010). One study reported significant reductions in social problems (Huang-Storms et al., 2007). One study reported that participants felt that they learned to trust others and felt more comfortable opening up, which improved social relationships (Callaghan et al., 2019). One study reported significant changes in pro-social and attachment behaviours (Purvis et al., 2014). One study reported better friendships at school, including making new friends (Lawson & Hight, 2015).

3.5 Discussion

This review examined current interventions targeting children who have experienced physical abuse. Specifically, it aimed to:

- Determine the efficacy of current interventions for children who have experienced physical abuse,
- Determine promising therapeutic approaches addressing behavioural, cognitive, and socio-emotional needs specific to experiencing physical abuse

A meta-analysis of intervention efficacy could not be conducted due to the heterogeneity in study type, outcome measures and reported data. Thus, whilst efficacy could not be determined of current interventions for children who have experienced abuse, the narrative synthesis indicates points for consideration and recommendation moving forward.

For the studies included in this review there were 11 different study designs, allowing only seven studies to be evaluated for risk of bias using the Cochrane Risk-of-Bias assessment tool (Carrion et al. 2013; Dauber et al., 2015; Farkas et al., 2010; Konanur et al., 2015; McCullough and Matura, 2019; Purvis et al., 2015; Taussig and Culhane, 2010). For the ten remaining studies, risk of bias could not be evaluated (Barker & Place, 2005; Beltran et al., 2016; Callaghan et al., 2019; Feather & Ronan, 2009; Huang-Storms et al., 2007; Lawson & Hight, 2015; Meuller & McCullough, 2017; Norton et al., 2017; Parish et al., 1985; Purvis et al., 2014). While the quality assessment checklists used for the ten studies provide a valuable assessment of the studies, they did not include a full risk of bias assessment (Joanna Briggs Institute, 2020). This is problematic in assessing the efficacy of the studies because differing degrees of biases may have impacted the observed intervention effect (Higgins et al., 2019). Determining risk of bias is integral for transparent (and, therefore, replicable) research and reliable interventions (Viswanathan et al., 2017). Thus, whilst the first aim of assessing efficacy could not be fully tested, the current review does highlight the need for more rigorous study designs and more transparent reporting to enable a clearer risk of bias assessment.

Whilst comparisons of efficacy across studies is limited, each study reported effective results post-intervention in at least one outcome area. There were improvements highlighted across all outcomes including, behavioural, cognitive, and socio-emotional areas for a number of studies (Barker & Place, 2005; Huang-Storms et al., 2007; Lawson & Hight, 2015; McCullough & Matura, 2019; Norton et al., 2017; Purvis et al., 2014; Taussig & Culhane, 2010). Improvements in behaviour and cognitive areas were most frequently reported (Dauber et al., 2015; Farkas et al., 2010; Feather & Ronan, 2009; Konanur et al., 2015; Mueller & McCullough, 2017; Purvis et al., 2015). Whereas improvements in socio-emotional and behavioural outcomes were not as frequently reported (Beltran et al., 2016; Callaghan et al., 2019). However, socio-emotional and cognitive outcomes were rarely found to improve post intervention (Parish et al., 1985; Carrion et al., 2013, respectively). Though each study reported improvements in at least one outcome area, tools used to measure outcomes varied greatly; suggesting there may be need to use standardised tools.

Who reported on outcome measures also varied amongst studies. For example, The Trauma Symptom Checklist for Children frequently had both children (Dauber et al., 2015; Farkas et al., 2010; Lawson & Hight, 2015; Taussig & Culhane, 2010; Norton et al., 2017) and parents reporting (Purvis et al., 2015; Konanur et al., 2015). The differences in who is reporting may be problematic as parents and children have been found to disagree in relation to reporting children's physical, emotional, and behavioural problems (Bambrah et al., 2018). Discrepancies in reporting may, therefore, not show an accurate depiction of the effectiveness of interventions. Parent reports may present a proxy bias by underreporting or overreporting symptoms (Zini & Banfi, 2018). As such, future research must consider adopting standardised measures and clear outlines of who should be reporting.

Additionally, synthesis revealed that mode of delivery of intervention influenced outcomes. For example, interventions delivering group therapy reported positive results on socio-emotional outcomes, whereas two interventions that delivered individual sessions reported improvements in all outcomes (Barker & Place, 2005; Huang-Storms et al., 2007). This suggests that individual sessions may be more beneficial in treating behavioural, cognitive, or socio-emotional areas than group sessions with peers. Literature surrounding group therapy for children who experienced physical abuse is scarce. Most literature surrounding interventions for this population include individual or group family sessions (Cohen et al., 2007). In this review, some interventions that used multiple components including family therapy or concurrent individual parent therapy, reported improvements in all outcomes (Purvis et al., 2014; Lawson & Hight, 2015; McCullough & Matura, 2019; Norton et al., 2017), others reported improvements in only behavioural and cognitive outcomes (Dauber et al., 2015; Farkas et al., 2010; Feather & Ronan, 2009; Konanur et al., 2015; Purvis et al., 2015), or in only cognitive or socio-emotional respectively (Carrion et al., 2013; Parish et al., 1985). Including family in therapy appears crucial in repairing relationships between parent and child, as well as providing parents with necessary skills to enhance safety and future development (Cohen et al., 2006; Sexton & Datchi, 2014). Additionally, incorporating family-based therapy has been found to be effective in treating issues which arise from child physical abuse as these therapies allow for parenting skill and overall supportiveness to be addressed (Carr, 2014). Therefore, incorporating family sessions in interventions may help to improve more outcome areas such as attachment, or relationship related issues (i.e. social anxiety, or socio-emotional issues). In addition to family sessions, studies which included parent training yielded improved outcomes. For example, Purvis et al. (2015)

employed a Trauma-Informed Parent Training Intervention, which showed reports of lower aggression and anxiety, while also promoting prosocial behaviour. This intervention included a four-day training for parents, subsequently limiting clinician sessions and teaching caregivers' strategies designed to improve behavioural outcomes for children. In this intervention, parent training proved to be useful in providing consistency in intervention techniques. Though limited, the results of the studies included in this review provide insight into the ways in which parent training may be crucial in treating this population. Commonly, parent training programs are often targeted at preventing or reducing child maltreatment or abuse, instead of providing parents with therapeutic techniques to assist in treating their child (Gubbels et al., 2019). Reasons for this may be due to the large negative impact of child maltreatment and the desire to prevent it before it begins (Gubbels et al., 2019). Though, preventing child maltreatment and abuse is vitally important, training parents to assist in their child's treatment may be just as important. The findings from this review show how parent training can positively impact a child's treatment and future research should consider exploring this notion further.

Theoretical approaches informing interventions were largely either trauma-based (Farkas et al., 2010; Feather & Ronan, 2009; Lawson & Hight, 2015; Konanur et al., 2015; Norton et al., 2017; Purvis et al., 2014; Purvis et al., 2015), or attachment-based (Dauber et al., 2015; Purvis et al., 2014; Purvis et al., 2015). Trauma-based interventions focus on a comprehensive treatment plan to address a multitude of issues (Cohen et al., 2010; Menschner & Maul, 2016). More specifically, trauma-based interventions primarily focus on six components: safety, trustworthiness; peer support; collaboration; empowerment; and cultural, historical and gender issues (Substance Abuse and Mental Health Services Administration, 2014); in these components emotional and behavioural trauma-related issues are addressed (Cohen et al., 2010). Indeed, trauma-based interventions reported improvements in either all outcomes (Norton et al., 2017; Purvis et al., 2014), or in behavioural and cognitive outcomes (Farkas et al., 2010; Feather & Ronan, 2009; Konanur et al., 2015; Lawson & Hight, 2015; Purvis et al., 2015). However, nine studies demonstrated promise of other theoretical approaches. For example, similar to research considering attention deficit disorder, insomnia, schizophrenia, autism spectrum disorder, and learning disabilities such as dyslexia (Marzbani et al., 2016), qEEG neurofeedback improved behavioural outcomes in children with traumatic histories (Haung-Storms et al., 2007). Thus, further examination of novel approaches is warranted.

A further important finding is that integrating therapeutic approaches could improve outcomes. For example, similar to research considering attention deficit disorder, insomnia, schizophrenia and learning disabilities (Marzbani et al., 2016), qEEG neurofeedback improved behavioural outcomes (Huang-Storms et al., 2007). Moreover, interventions utilising methods such as neurofeedback or motivation-adaptive skills-trauma resolution/eye movement desensitization and reprocessing (MASTR/EMDR) yielded significant results (Haung-Storms et al., 2007; Farkas et al., 2010). Consistent with literature, EMDR has been well documented in those with posttraumatic stress disorder and is preferred by some individuals as it does not involve long exposure to past traumatic experiences (Chen et al., 2018). In addition, MASTR therapy is commonly used for children with trauma and conduct issues and utilises a number of different components such as development of coping skills, cognitive-behavioural training, and motivational interviewing (Chen et al., 2018; Greenwald, 2009). Another integrated intervention which proved to be successful was Neuro-

Physiological Psychotherapy (NPP; McCullough & Matura, 2019). Incorporating a biological element into psychotherapy while focusing on somatosensory systems, behavioural responses, and attachment systems, provided a comprehensive approach to treatment. The NPP approach utilises components of talk therapy while also focusing on somatic responses to stress allowing for better emotional regulation in response to triggers (Shafir, 2016; McCullough & Matura, 2019). Given the variety of different physical and mental effects of physical abuse, a more comprehensive therapy (e.g. MASTR/EMDR or NPP) is likely to show improvements in outcomes related to physical abuse. The findings from this review highlight the need to further research alternative methods of treatment, particularly those which include combinations of different components of interventions.

3.5.1 Limitations

While randomised controlled trials (RCTs) are generally considered a 'gold standard', only four studies met this criterion. Additionally, the heterogeneity of the studies made direct comparisons difficult and the small sample sizes and lack of control groups reduced the ability to generalise the effectiveness of the interventions. Thus, further research using RCTs, and the use of larger sample sizes is necessary.

The initial search was also limited to the databases included in the University of Gloucestershire's electronic library database; grey literature was not searched. Grey literature may have helped the review be more comprehensive by using articles which may have served a smaller population; grey literature may have also helped to decrease publisher bias in this review. However, grey literature is not typically peer-reviewed leading to less rigorous research, it can contribute to search inefficiencies and a lack of search replication for future studies (Adams et al., 2016). As such, grey literature was not considered for this review.

As the search was performed using the University's library database, certain other databases which may hold relevant articles were not included in this review. Thus, further review including more search engines would be advantageous to our understanding of the area.

The small number of studies included (and the heterogeneity of study designs and analyses conducted), means that meta-analysis was not appropriate and generalisations from this review are limited. Therefore, further research is needed into this important topic to identify which interventions are most effective.

3.5.2 Implications for Future Research and Interventions

The issues around heterogeneity of the studies, raise concerns around study development and reporting. It is imperative that studies reporting therapeutic interventions provide sufficient information, including appropriate data for future synthesis. There is also a need for further rigorous research adopting RCT designs and including well-validated instruments in capturing relevant outcomes given the range of instruments in assessing outcomes for the included studies, which rendered synthesis difficult.

This review highlights the potential benefit of combining therapies to improve all-round outcomes. For example, Adventure Therapy could be used to improve family relationships (whilst simultaneously training caregivers with strategies to improve behaviour outcomes

using Trauma-Informed Parent Training Intervention). Similarly, combining MASTR and EMDR provided promising long-term results. However, given the inability to assess efficacy, such conclusions must be taken with caution. Further research is essential in determining best practice for children who have experienced physical abuse.

It is also important for research to learn from the increased use of tele-medicine resulting from the SARS-CoV-2 virus global pandemic in 2020 (Sammons et al., 2020), which could open interventions to those who could not normally attend in-clinic treatments (e.g., if they live far away, do not have access to suitable transport, etc.). However, caution needs to be taken to ensure the efficacy of current intervention is not lost or reduced during online interventions.

Future research should consider adopting a standardised outcome measure for both parents and children which may help reduce these biases. Though parent reporting may still be subject to proxy bias, cross reporting with a standardised measure for children may counteract proxy bias. Additionally, adopting standardised measures may reduce fatigue bias as each person reporting would not have to report on a number of different measures which measure different outcomes at a single collection point. Utilising standardised measures would also assist in creating reliability and comparability across studies.

Using a narrative synthesis approach this review explored studies which discussed interventions for children who experienced physical abuse. The findings showed that there is a greater need for more research, and standardised approaches and tools involved in interventions for this population. These tools should include a clear and consistent guideline on who should be reporting on each review, standardised definitions for outcome areas, as well as clear stipulations surrounding which measures should be used to assess correlating outcome areas.

In addition, fidelity of studies is an important consideration for correct implementation of interventions. There are a number of factors which may contribute to the fidelity of studies including the context in which the intervention was delivered, who delivered the intervention, and information regarding intervention protocol (Toomey et al., 2020). Commonly, poor reporting of these factors and lack of transparency in research can lead to difficulty in assessing intervention fidelity (Toomey et al., 2020). As such, future research should consider publishing intervention protocol, as well as providing more transparency in research regarding contextual factors and exactly who is delivering the intervention.

3.5.3 Conclusion

This review used a narrative synthesis approach to explore interventions for children who have experienced physical abuse. It aimed to determine the efficacy of current interventions in place for children who experienced physical abuse; determine most improved areas of specified outcomes while using current interventions in place for children who have experienced physical abuse; and determine successful methodologies/basis of current interventions in place for children who have experienced physical abuse. This review found that, most commonly, interventions in place for children who have experienced physical abuse use a trauma-focused or trauma-informed approach. Interventions rooted in TF-CBT yielded successful results in treating cognitive and behavioural issues. However, other alternative methods, such as qEEG neurofeedback, were also effective in treating

behavioural issues as well as socio-emotional issues. Interventions which involved family and not just an individual, were successful in helping to build familial relationships by working on communication and team skill building. Though each article included in this review reported effective results, the heterogeneity of the study designs and analyses performed caused difficulties in directly comparing each intervention; therefore, determining which intervention was most effective overall was not possible. However, this review discussed important implications for further research in this area, including having more standardised study designs and measures, as well as exploring alternative methods of treatment.

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