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The Impact of Childhood Neglect on Cognition in School-Aged Children

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ABSTRACT

Childhood neglect is the most ubiquitous and prevalent form of adverse childhood experiences (ACEs). Given the significance of cognitive function and its malleability in retort to environmental stimuli, there is significant relevance in understanding the impact of child neglect on cognitive domains. Furthermore, examining the cognitive domains individually enables a more nuanced understanding of the impact of childhood neglect. This article details a scoping review undertaken to explore the relationship between childhood neglect and cognitive function, with the aim to recognize the observable cognitive qualities in neglected children, in the absenteeism of other ACEs. Cognitive function was divided into five domains: executive function, academic achievement, language, memory and intelligence. The findings demonstrated that executive function (working memory and attention shifting), language and intelligence were associated with childhood neglect, and there was no association between executive function (spatial planning), academic achievement, memory and childhood neglect.

Introduction

Adverse childhood experiences or ACEs are stressful and traumatic events that arise in a child's early life Felitti (1998) et al. [1]; McLaughlin (2019) et al. [2]. ACEs is an umbrella term for different types of early adversity Peterson (2013) [3]. This includes direct harm to children otherwise known as child maltreatment McLaughlin (2019) et al. [2] and includes physical abuse, sexual abuse, and/or neglect. ACEs can also be indirect through their living environments, for example through parental conflict, mental illness or substance abuse Hughes et (2017) et al. [4]. Differentiating between the impact of different ACEs is difficult, as studies historically present findings as a combined cumulative risk score rather than distinct ACEs Evans (2013) et al. [5].

Childhood neglect is the most ubiquitous and prevalent form of ACEs English (2005) et al. [6] Maguire (2015) et al. [7]. Although it is associated with substantial mortality Dubowitz (2004) et al. [8], it is the least empirically studied form of child maltreatment De Bellis (2005) [9]. The significance of child neglect should come as no surprise, given that a lack of parental care, a trademark of neglect, is an extreme risk to children's growth and well-being Rutter (2000) et al. [10].

As schools are obliged to take accountability for promoting and safeguarding the welfare of young children Great Britain (2002) [11], distinguishable characteristics of school-aged children facing neglect need to be taken from recent literature Maguire (2015) et al. [7]. Teachers and schooling staff interact with the same children on a virtually daily basis. Therefore, they are in the best setting to witness the children's behaviour Burgess 2011 et al. [12]. McGarry and Buckley, 2013 [13] International research highlights that teachers feel uncomfortable with the idea of notifying child protection services of suspected or known neglect Gilbert [14]. Their response was mainly due to a lack of knowledge regarding the signs of neglect [12].

Children's environments structure their cognitive function Nisbett (2012) et al. [15]. A child must develop through the cognitive development stages for future health and achievement Noble (2015) et al. [16]. Given the significance of cognitive function and its malleability in retort to environmental stimuli [15] there is significant interest in understanding the impact of neglect on cognitive outcomes Guinosso (2016) et al. [17].

Once neglected children start in education, indicators of academic concern rapidly appear Peterson (2013) et al. [3]. Academic achievement signifies performance outcomes that signify the degree to which a child has completed educational objectives Woolfolk (2007) [18]. In a longitudinal study, neglected children in kindergarten were regarded by their teachers as having more trouble understanding school tasks, compared to children who had not been neglected Erickson (1989) et al. [19]. By second grade, most of the neglected children had been referred to special education services Egeland (1991) [20]. This display of academic difficulties increased during their school years and was seen through into adolescence Egeland (1997) [21].

Moreover, childhood neglect and the impact on the language domain has been previously studied Eigsti (2004) [21]. Language is a structured system of communication and involves skills such as listening and reading (receptive skills) and writing and speaking (productive skills; Trask (2007) [22]). Language delay becomes more evident as children grow older, with research finding that neglected children demonstrated more syntactic delays and reduced vocabulary than control groups [23]. Language delay is also apparent when child maltreatment types are compared. Children who had been neglected had more delays in receptive language (auditory comprehension) and expressive language (verbal ability) than children who had been physically abused Allen (1982) et al. [24]; Culp (1991) [25].

While previous reviews have been published looking at ACEs and cognitive function Maguire (2015) [11]; Guinosso (2016) [17]; Kavanaugh (2017) et al. [26]; Carlson (2019) [27]; Yingying (2019) [28]. Most reviews Guinosso et al. [25-28] focus on child maltreatment as a homogenous group and do not differentiate between child abuse and child neglect [3]. Others combine child neglect and emotional abuse Maguire 2015 [7]. In recent years, there has been increased attention to isolate specific ACEs for targeted interventions and to identify the specific characteristics such children display McLaughlin (2014) [2,29].

This article details a scoping review that was undertaken to explore the relationship between childhood neglect and cognitive function. To recognize the observable cognitive qualities in neglected children, in the absenteeism of other ACEs, to gain a better understanding of the behaviours they may exhibit.

Aim

To provide a comprehensive overview of the impact of childhood neglect on cognition in school-aged children.

Method

The process and results reporting were guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines, 2009 revision Moher (2009) [30]. Three databases – MEDLINE, PsycINFO and Cumulative Index to Nursing and Allied Health Literature (CINAHL) – were searched using the following terms: (S1) childhood: child*, early childhood, middle childhood; (S2) neglect: early neglect, neglect, emotional neglect*, physical* neglect* and (S3) cognition: cognit*, language, visuospatial, memory, attention, executive function*, intelligen*. Truncation symbols and the boolean operator 'AND' was used in the advanced search strategy to link the different groupings of search terms (S1 AND S2 AND S3).

The inclusion criteria were that the studies had to:

a) Be peer-reviewed research.

b) Involve school-aged children (6-12 years of age) with confirmed cases of neglect by child protection services (CPS) or other governed bodies.

c) Explore the outcome of cognitive domains.

d) Have been published in an academic journal in the English language, between January 2010 and January 2020.

Neglect is defined as the inability to offer health, education, emotional development, nutrition and secure living environments, for the development of the child. Also, if there is a high possibility of causing harm to the child's mental, physical, spiritual or social development. This involves the inability to appropriately supervise and safeguard children from harm harm (World Health Organisation, 1999) [31].

Studies that focused on other ACEs, such as physical, sexual, and/or emotional abuse were excluded. Case studies, literature reviews and grey literature were also excluded. Of the 483 articles initially identified, 89 articles were excluded due to duplication. 394 articles were screened for relevance. On reviewing the titles and abstracts, 340 articles were excluded, as they were found not to meet the inclusion criteria. With the remaining 54 articles, full-text articles were assessed and 42 were excluded, leaving 12 articles. One additional article of interest was identified when screening the reference lists of the 12 final articles. Therefore, a total of 13 studies were included in the review. The Consolidated Standards of Reporting Trials (CONSORT) checklist was used to critically appraise the quality and the reliability of the included studies, none of which were rejected based on the appraisal Moher (2010) [32].

Figure 1 is a PRISMA flow diagram, to present the flow of information through different stages. Table 1 provides a summary of the studies included in the scoping review. Once the articles had been selected, data of each study's aim, population, method and findings were extracted. The data extracted from each study were entered into a table to summarize the included studies. The authors challenged each other's interpretations and worked collaboratively to deepen the discussion and interpretation and enhance rigour and quality Whiting (2017) [33].

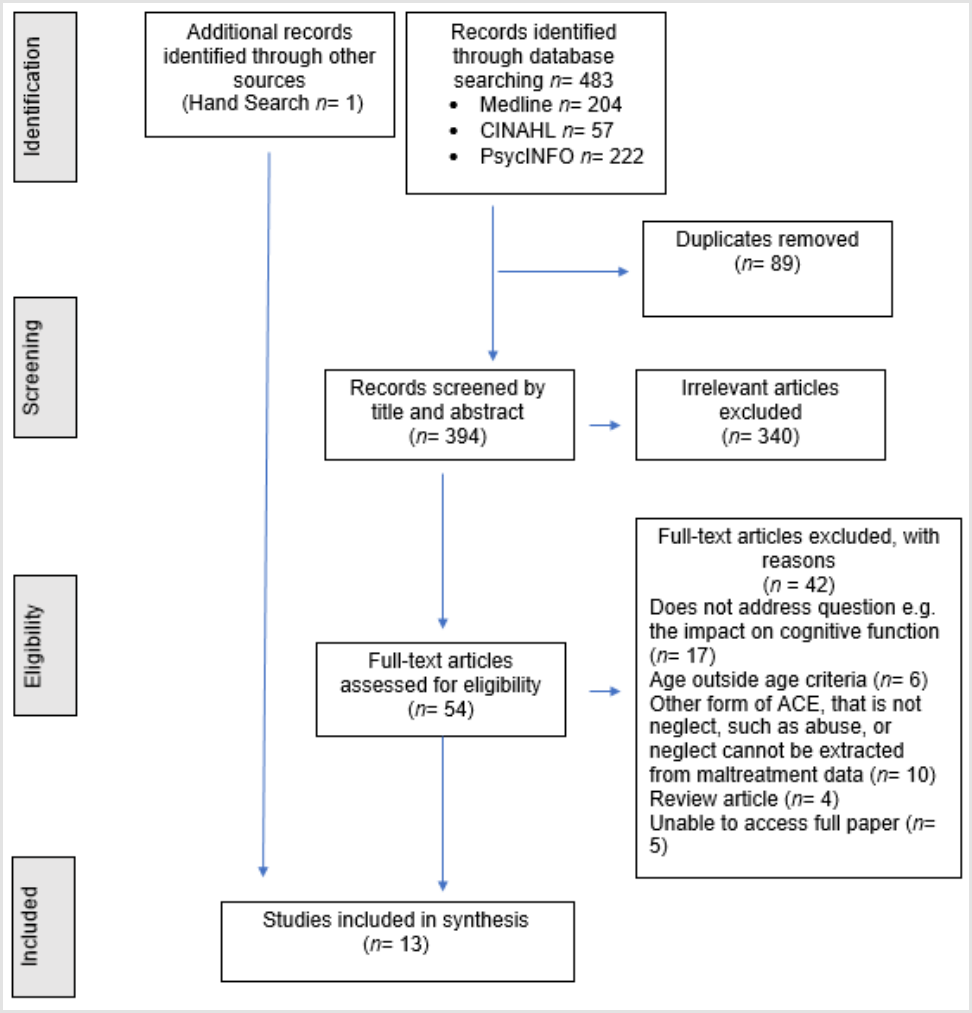

Figure 1: PRISMA flow diagram.

Table 1: Summary of the studies included in the scoping review.

Study Author	Sample	Exclusion	Neglect group	Control group	Maltreatment type	Domains assessed	Relevant non-significant findings	Significant findings	Located from
Bengwasan (2018) [52]	Referred by DWSD and NGOs	Children with verbal, EA or psychological abuse, or co-occurring types of abuse. Previously taken the tests or have intellectual or neuro-cognitive conditions.	300 children aged 4-17 years grouped 100 in PA, 100 SA and 100 children in neglect group	N/A	SA, PA, and Neglect	Intelligence	N/A	PA mean higher score in SB5 and all indices than SA and N	Medline

Bick (2018) et al. [39]	Children who participated previously in BEIP	N/A	150 children 8-10 years of age grouped (1) 49 in care as usual group, (2) 50 in foster group	(3) 51 children never institutionalised group	Institutional neglect	Executive function and memory	No change from 8-12 years across all tasks	Institutionally reared children showed poorer performance on memory and executive function tasks	Medline
Chae (2011) et al. [51]	Inpatient unit – referrals from CPS	N/A	322 children 3-16 years, consisting of 3-5 years old (M=4.1 years, n= 106), 6–10-year-olds (M=7.8 years, n=154) and 11–16-year-olds (M=12.3, n=62)	Control group – no abuse or neglect	SA, PA, both sexual and physical abuse and neglect	Memory	Abuse and neglect not found to affect memory	N/A	Medline
Cicchetti (2010) et al. [50]	Identified by DHS	N/A	317 Children of an average age of 9.17 years old (SD=2.43, range: 6-13) – (1) maltreated group (n=143)	Non-maltreated group (n-174)	Neglect (physical), emotional maltreatment, PA, and SA	Memory	Basic recall and recognition memory in neglect, did not differ from control	Cortisol level to false recognition in neglect and emotional maltreatment. PN/EM has increased false recognition memory	Medline
De Bellis, Woolley and Hooper (2013) [9]	CPS	IQ<70, a disability, a significant medical illness, head injury or neurological disorder, birth weight <5lbs and prenatal complications	Children aged 6-17 – (1) Maltreated group (n=38) (age - M=11.87, SD=3.08) and (2) maltreated + PTSD group (n=60) (M=11.74, SD=3.32)	Control group (3) youth (n=104) (M=12.52, SD=3.04).	Witnessing domestic violence, PA, SA, EA, and Neglect	Language and memory	Did not reveal distinct profiles between the two maltreatment groups, no group differences in the fine motor domain	Generally, failure to supervise index and failure to provide has lower scores than other maltreatment groups in all cognitive domains	Medline
Hanson (2013) et al. [38]	Recruited from CPS	N/A	63 children (25 who had experienced early neglect) – between the ages of 9 and 14 years of age (Mean age = 140.42 +/- 19.87 months)	38 children who had not experienced neglect (Mean age = 142.43 +/- 21.6 months)	Neglect	Memory and executive function	N/A	Children who have suffered early neglect displayed poorer neurocognitive performance compared to comparison children – more total errors on the IED, PAL, and SWM and solved fewer problems on the SOC	Medline

Lum, Powell and, Snow (2018) [47]	Recruited by government records of CPA	N/A	82 children aged between 5 and 12 years old	N/A	PA, SA, EA, and Neglect	Language	Language functioning was not related to the presence of neglect	N/A	PsycINFO
McGuire and Jackson (2018) [43]	Records are taken from DSS	Prior ASD or psychosis, or non-native English speaker	490 youths aged between 8 and 18 in foster care	N/A	Neglect, EA PA, and SA	Academic Achievement	Neglect frequency and severity was not associated with school grades	Only neglect was a marginally significant predictor of English grades	PsycINFO
Manly (2013) et al. [42]	Recruiter through DHS	N/A	170 children – maltreated children (n=111) between 4 and 6 years of age	Non maltreated group (n=59)	Maltreatment – defined as physical neglect	Academic Achievement and intelligence	Neglect severity not directly associated with first-grade academic performance but rather indirectly related to cognitive performance	Neglect associated with decreased language (kindergarten) and math grades (first grade) and lower scores overall on first-grade academic achievement	Medline
O'Hara, (2015) et al. [53]	The National Center for Child Abuse and Neglect	Neglect and/or abuse was not reported in the first four years of life	372 children assessed at aged 6. 271 in neglect only group, 101 in the neglect + physical abuse group	N/A	Neglect and PA	Intelligence	N/A	Neglect group – scored worse than other groups in vocab/ language	Medline
Petrenko (2012) et al. [44]	In out-of-home care because of court orders due to maltreatment	If they did not experience maltreatment or records did not provide enough information. Not Spanish and no developmental delays	334 Children aged 9-11 years, placed in out-of-home care	N/A	SA, PA, Physical Neglect, and Supervisory neglect	Academic Achievement and intelligence	Physical Neglect did not predict any DV's. no subtype difference in nonverbal scores or academic achievement	Supervisory Neglect associated with higher verbal scores	Medline
Pollak (2010) et al. [40]	Minnesota and Wisconsin International Adoption Project Registries	IQ<78, parents reported congenital abnormalities and failure on the FAS screener	132 children aged between 8-9 years. 3 groups (1) post-institutional – PI. (2) early adopted group– EA	(3) children born and raised with their birth families - NA	Institutional Neglect/ Deprivation	Executive function and memory	N/A	PI performed poorly than both EA and NA on SWM, PAL, and Attention	Hand search – Found in Hanson, et al (2013)

Spratt et al. (2012) [48]	Data obtained from CPS	Children with malnutrition, obesity, birth complication, neurobiological disorders, medical conditions, and children in current CPS	Children aged 3-10 years. (1) 17 children with a history of familial neglect (USN), (2) 15 children with a history of institutional rearing (IA)	(3) 28 Children without a history of neglect (control group)	Neglect	Language	N/A	Compared to those do not neglect, USN and IA demonstrated lower cognitive and language scores	PsycINFO

Findings

The first stage of analysis was assessing the heterogeneity of the included articles. A high heterogeneity among these characteristics of included articles precluded the use of a meta-analysis. This is because high heterogeneity violates the underlying assumption of a normal distribution Higgins (2009) [34]. As recommended by the Cochrane review/collaboration Higgins (2019) [35] a narrative synthesis was used to explore the relationship between childhood neglect and cognitive function.

To provide a comprehensive review, cognitive function was divided into five subcategories: executive function, academic achievement, language, memory and intelligence Yingying (2019) [28]. Once all the articles had been grouped into subcategories, this made it substantially easier to explore the relationships within and between articles. Further grouping occurred for studies that used the same neurocognitive tests.

Executive Function

Executive function was divided into working memory, attention shifting and spatial planning. Whether executive function ought to be conceptualized as a unitary concept or several separate functions has been a matter of discussion Stuss and Alexander (2000) [36]. However, further research suggests executive function is best considered as distinct functions Blair (2005) et al. [37].

Working Memory

Using the Cambridge Neuropsychological Test and Automated Battery (CANTAB), spatial working memory task, one study Hanson (2013) et al. [38] found that children who had suffered early neglect have more total errors, compared to children who had not suffered early neglect ($p<.001$). Similar results were found by Bick et al. (2018) [39], children in the ever-institutionalized group made more total errors than children in the never institutionalized group. Those in the ever-institutionalized group also presented significantly worse strategy scores, relative to the never institutionalized group ($\beta=-.341$, $p<.001$; [39]). Moreover, Pollak et al. [40] found there was a distinction amongst the groups on the spatial working memory (SWM) subtest, $F(2, 128)=7.96$, $p=.001$. Post-institutionalized (neglected) children performed more poorly than both the emotional abuse ($p=.008$) group and the control group ($p=.001$). The included studies all used the same CANTAB which ensured interstudy homogeneity and all studies found similar results. Therefore, this review will accept that childhood neglect is associated with the working memory domain.

Attention Shifting

Two studies found that neglected children showed significantly poor performance Hanson (2013) et al. [38]; Bick (2018) et al. [39]. In one study Bick (2018) et al. [39], the institutionalized group committed more total errors, even when amended for the number of levels accomplished, compared to those never institutionalized ($\beta=-.327$, $p<.001$). Similar results were found by Hanson (2013) et al. [38], who found that children with early neglect had more total errors than children who had not suffered neglect ($p=.012$).

Conversely, Pollak (2010) [40] discovered no substantial differences between the three groups (institutional neglect, early adoption, and control group), with the intra-extra dimensional set-shifting (ID/ED) test ($p>.05$). Further tests on attention demonstrated that all groups performed similarly on auditory attention tests. However, the groups varied on the visual attention tests, as children in the post-institutionalized (neglected) group, $F(2,116) =8.96$, $p=.001$, performed more poorly than those in the early adoption group ($p=.001$) and control group ($p=.006$). Although the included studies found mixed results, they all used the same CANTAB which ensured interstudy homogeneity. Pollak et al. (2010) [40] originally discovered no difference in attention shifting between the groups when using the ID/ED test. An explanation for this is the ability to voluntarily focus or shift attention cultivates between 7 and 9 years of age Anderson (2010) [41] and Pollak et al. (2010) [40] recruited participants between the ages of 8 and 9 years. Their capability to shift attention may not have fully developed by the study. Therefore, this review will accept that childhood neglect is associated with the attention shifting domain.

Spatial Planning

One study Hanson (2013) et al. [38] found that children who suffered early neglect completed fewer problems on the subtest of the CANTAB is the Stockings of Cambridge (SOC) test, in the minimum number of moves ($F=8.797$, $p=.005$), compared to the control group. The other two studies found that childhood

neglect did not have an impact on spatial planning. Bick et al. [39] found that the number of problems completed in the minimum number of moves did not significantly vary between children with or without histories of institutional/neglect rearing (β=−.224, p<.013). Similar results were found by Pollak et al. (2010) [40], post-institutionalized (neglected) children performed well on tests of executive processing involving manipulation and spatial planning (p>.05). The included studies found mixed results, but with more studies finding that neglect did not have an impact on spatial planning. Neglected children are often left alone to deal with their environment so they adjust and learn themselves. Therefore, when it comes to tasks of planning and solving, they are superior compared to other children Maguire (2015) et al. [7]. Hence, this review will accept that childhood neglect is not associated with the spatial planning domain.

Academic Achievement

Two studies used school grades to assess academic achievement. One study Manly (2013) et al. [42] found that childhood neglect was associated with diminished language arts, in kindergarten. Neglect was also associated with mathematics results, in first-grade, and poorer results in general in first-grade academic achievement. Nevertheless, neglect severity was found to not be directly related to first-grade academic achievement, but rather indirectly associated with cognitive function. However, McGuire and Jackson (2018) [43] found that emotional abuse severity and physical abuse was a significant predictor of English grades. Neglect was found to not be a significant predictor of grades and no variables predicted mathematics grades. Only neglect frequency was a substantial predictor of English grades (B=0.17, p=.06). Petrenko (2012) et al. [44] used the Wechsler Individual Achievement Test (WIAT) and found similar results to McGuire and Jackson (2018) [43]. Physical neglect and supervisory neglect did not predict academic achievement when using the WIAT test. The only significant predictor of lower academic achievements was having a previous period of out-of-home care (B=−3.55, t =−2.24, p=.026).

Petrenko (2012) et al. [44] and McGuire and Jackson (2018) [43] use different measurement tools, but both found that childhood neglect was not associated with academic achievement York (2015) [45]. Both studies focused on older children and who had been in foster care [41] or in out-of-home care [42]. Whereas, manly who found that childhood neglect was associated with language arts and mathematics, focused on younger children and those recruited through the Department of Health Services (DHS). Given the variances in data collections techniques, for example, how neglect was recorded, inconsistencies between studies are common. These discrepancies partially explain differences in association with academic functions [43]. Moreover, another reason for the discrepancy in study's findings could be due to the variation of what is deemed as academic achievement. From the included articles, given that there were mixed results and more studies found no association, this review will accept that childhood neglect is not associated with academic achievement.

Language

Two studies used the Clinical Evaluation of Language Fundamentals (CELF) test and both studies found that childhood neglect did not correlate with language. De Bellis, Woolley and Hooper (2013) [46] Lum (2018) et al. [47]. De Bellis (2013) et al. found that only sexual abuse significantly and negatively correlated with language (p<.05). Similar results by Lum, Powell and Snow (2018) [47] found on a group level (neglect, emotional abuse, physical abuse, and sexual abuse), language skills are, on average, below the normative mean (t(82) =5.013, p<.001). However, when neglect was considered on its own, children's overall language functioning was not found to be related to neglect.

Whereas Spratt (2012) et al. [48] who used the Test of Early Language Development (TELD) found that when adjusting for socioeconomic status, participants in the control group displayed higher levels of language functioning than both neglect groups. The control group performed significantly better than the United States children with a history of physical or emotional neglect (USN) group on TELD receptive (p=.004), expressive (p=.006) and oral composite (p=.002). Children in the control group performed significantly better than children in the adopted from international institutions (IA) group on TELD receptive (p=.002), expressive (p<.001) and oral composite (p<.001).

The included articles in this review, found mixed results when it came to the association between childhood neglect and language. An explanation for the studies that found no association could be due to the measurement tool used. Despite the CELF's effort to formulate a comprehensive language tool, it lacks validity due to a misleading standardized sample and an inadequate reference standard Paslawski (2007) [49]. There is also an absence of data as to how items and tasks are considered appropriate. As the CELF is mainly vocabulary based, it will tend to recognize the socioeconomic status and second language acquisition concerns, rather than language development concerns, due to the significant linguistic, cultural and socioeconomic bias [49]. These concerns with the CELF could explain why the two studies De Bellis et al. [46,47] in this review found no association between neglect and language. Therefore, this review will accept that childhood neglect is associated with language.

Memory

Three studies used the Paired Associated Learning (PAL) test, to assess memory. One study Pollak et al. (2010) [40] discovered that post-institutionalized children significantly scored lower than the other two groups, F (2, 131) = 12.47, p = .001. Similar results were found by Hanson (2013) et al. [38]. Moreover, Bick et al. found that children in the institutionalized group made significantly more errors before completing a stage (β = −.254, p = .005). However,

after controlling for Intelligence Quotient (IQ), the number of levels completed did not differ between the ever and never institutionalized groups. The association between institutional rearing status and performance on any of the PAL subscales was no longer significant Bick (2018) et al. [39].

The studies that used the California Verbal Learning Test (CVLT) found that memory ability in children who had been neglected or abused was no different to children in the control group Cicchetti (2010) [50]. Cicchetti established that the experience of childhood neglect or abuse does not necessarily unfavorably affect, nor does it improve, basic memory (recall and recognition memory) for nontraumatic material De Bellis et al. (2013). De Bellis also used the CVLT test and found that only sexual abuse significantly and negatively correlated with memory.

Finally, Chae (2011) et al. [51] used the short-term memory subtest of the SB5. They found that there were no significant abuse or neglect differences or age and neglect/abuse interactions found in children's memory functioning. The included articles in this review, found mixed results when it came to the association between child neglect and memory. However, after controlling for confounder variables, most studies found that neglect had no significant impact on memory performance. Therefore, this review will accept that childhood neglect is not associated with memory.

Intelligence

All studies recognized a negative association between childhood neglect and IQ scores even after adjusting confounders. One study Bengwasan (2018) [52] used the Full-Scale Intelligence Quotient (FSIQ) which is comprised of non-verbal IQ (NVIQ) and verbal IQ (VIQ) and found significant differences between the groups, $F(2, 297)=16.766$, $p<.001$. The children in the physically abused group ($M=76.550$, $SD=11.515$) had the highest FSIQ mean score, compared to children in the sexually abused group, ($M=72.340$, $SD=12.324$) and the neglected group, ($M=66.99$, $SD=11.227$). (Manly (2013) et al. [42]; O'Hara (2015) et al. [53]) Two studies used the Wechsler Preschool and Primary Scale of Intelligence (WPPSI-R). One study (Manly et al., 2013) found a significant negative association between the severity of neglect to the IQ of children, after controlling for maternal IQ and demographic covariates. Severe neglect before the age of 4 was associated with diminished IQ at age 4. However, the link from IQ at age 4 and first-grade academic function at age 6 was statistically insignificant ($\beta=-0.008$, $p=.216$). Moreover, another study (O'Hara et al., 2015) using the WPSSI-R found that neglected children scored significantly worse than children who had been neglected and abused ($p=0.03$). However, the groups did not differ on the block design subtest ($p=0.4$). One study Petrenko et al. (2012) used the Kaufman Brief Intelligence Test (K-BIT) to measure intelligence. They found that the supervisory neglect group had better verbal IQ scores than the physical neglect group ($\beta=-4.00$, $p=.026$) and higher verbal IQ scores than children in the sexual abused/mixed class group ($p=.009$). Most studies included in this review found there was an association between child neglect and intelligence. Therefore, this review will accept that childhood neglect is associated with intelligence.

Discussion

The findings from this review provided evidence that child neglect is associated with cognitive function and does have an impact on domains such as executive function (working memory and attention shifting), language and intelligence. However, the articles included in this review also found no association between neglect and executive function (spatial planning), academic achievement and memory. Although the findings from the 13 included articles found mixed results with regards to the association between child neglect and cognitive function. It is clear from the findings and previous research the difficulties that children with neglect face, from poverty to a lack of parental care, impacting their growth and well-being Rutter and Sroufe, (2000). This demonstrates the detrimental effects of not just neglect, but ACEs in general.

Limitations

In the included studies, the definition of neglect was highly variable. This made it difficult to make comparisons and similarities between the studies. Due to high heterogeneity, this precluded the use of a meta-analysis and justified the use of narrative synthesis Higgins (2009) [33]. It could be argued if there is no single operational definition for neglect, this makes it challenging to interpret and compare the findings of the research and to establish whether children are eligible for services. Moreover, in many of the included studies, the use of a wide range of age groups meant it was impossible to make comparisons and similarities between the studies. It can be argued that different regions of the brain develop at different stages. Therefore, this may be the reason there is a difference between two studies using different age bands, instead of it being as a result of childhood neglect.

Recommendations for Practice

Several recommendations for education professionals can be made based on the findings of this scoping review. Understanding the nature and frequency of ACEs in school-aged children, particularly at a young age (6-12 years of age) can guide teachers who feel they lack the knowledge of indicating neglect. By recognizing neglect and intervening early, teachers can help children who have been neglected to attain better performance in school. Recognising the impact of neglect on children can help to understand why classrooms can be challenging and upsetting places for these children. Consistent with the findings from this review and previous research, neglected children have enhanced problem solving and spatial planning skills, so these children may sometimes be seen as more independent than other children Maguire et al. (2015) [7]. At the same time, they may also have

difficulty with classroom routines and other elements. Therefore, if teachers are aware of these styles of cognitive features, then child neglect can be recognized early on. Moreover, by understanding childhood neglect in school-aged children, research can help to justify the allocation of resources at a widespread level within a multitiered framework [54].

Conclusion

It is hoped that the results of this review will offer support for a universal definition of childhood neglect. Moreover, by understanding childhood neglect in school-aged children can also help to build on teachers knowledge of neglect and justify the allocation of resources at a widespread level within a multitiered framework.

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