

A Systematic Review of Reviews of the Outcome of Severe Neglect in Underresourced Childcare Institutions

TRAUMA, VIOLENCE, & ABUSE
2020, Vol. 21(3) 484-497
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DOI: 10.1177/1524838018777788
journals.sagepub.com/home/tva



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Abstract

The aim of the systematic review described in this article was to determine the outcomes for individuals exposed to severe neglect in congregate care institutions such as orphanages. In this context, severe neglect refers to failure to meet children's basic physical, developmental, and emotional needs due to inadequate resources. In this systematic review of previous systematic reviews and meta-analyses, searches of 10 databases were conducted, 18 papers that met inclusion and exclusion criteria were selected for review, their quality was assessed, and data were extracted and synthesized. The 550 primary studies included in the 18 systematic reviews and meta-analyses were relatively well designed, allowing confidence to be placed in their results. Severe neglect was associated with a wide range of problems in the domains of physical development, cognitive development, attachment, and mental health. The severity of adverse outcomes was partly influenced by the duration and severity of deprivation and a constellation of risk and protective factors. Prevention policies should aim to eliminate large underresourced congregate care institutions for infants. In taking steps toward this, policies should aim to adequately resource congregate care institutions to meet children's developmental needs for nutrition, stimulation, and attachment to a stable primary caregiver with adequate parenting skills and training. Early placement in adoptive or foster families, with access to routine physical and mental health-care service available in developed countries, is the most viable effective intervention for child survivors of severe neglect.

Keywords

neglect, child abuse, attachment, developmentally delayed

This article is a review of review papers on the outcome of severe neglect in orphanages that care for large groups of children, with inadequate and unstable staffing, and limited physical resources. It is the second in a series of three on the outcome of child maltreatment. The first article is a review of review papers on the outcome of child abuse in noninstitutional contexts (Carr, Duff, & Craddock, 2018a). The third article is a review of studies of outcomes for survivors of child abuse that occurred in long-term residential care (Carr, Duff, & Craddock, 2018b).

Severe neglect, which is also referred to in the literature as structural neglect, refers to failure to meet children's basic physical, developmental, and emotional needs within the context of orphanages that care for large groups of children, with inadequate and unstable staffing, and limited physical resources (van IJzendoorn et al., 2011). Distinctions may be made between the failure of institutions to meet three broad types of childhood needs (Gunnar, Bruce, & Grotevant, 2000). These include (1) physical needs such as nutrition, medical care, and hygiene essential for healthy physical growth; (2) developmental needs for stimulation to promote sensory motor, cognitive, and language development; and (3) the need for stable and meaningful interpersonal relationships with a

primary caregiver to facilitate the development of secure attachment and the capacity to make and maintain social relationships.

The prevalence of severe neglect associated with placing children in institutions is difficult to determine. Using 2002 government statistics, Browne, Hamilton-Giachritsis, Johnson, and Ostergren (2006) estimated that 43,842 (14.4/10,000) children under 3 years of age were in institutional care within 46 European and Asian countries. Surprisingly, within Europe, institutional care of young children was not restricted to developing countries but occurred throughout the entire region. Using 2001 U.S. Department of Health statistics, Browne et al. (2006) estimated that 11,777 children in the United States were in childcare institutions. In Europe, Asia, and the United States, most children were placed in care due to maltreatment,

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abandonment, or because of a disability. In the developing world (e.g., Africa and South America), vast numbers of young children are in institutional care, but prevalence statistics are unavailable.

In industrialized countries in the second half of the 20th century, there has been a gradual reduction in the use of large congregate settings to care for orphans (Hamilton-Giachritsis & Browne, 2012). Large orphanages came to be replaced by the provision of care by foster families and smaller family-like care centers. Policies underpinning this trend were influenced by Bowlby's (1951) seminal research on the critical role of parent-child attachment and the vast body of research which this spawned. This research showed that children raised in large institutions developed a wide range of problems in the domains of physical health including growth failure and impaired neurobiological development, mental health difficulties including behavior problems and impaired cognitive development, and problematic social adjustment including attachment difficulties and problems making and maintaining relationships (Bakermans-Kranenburg et al., 2011; McCall, 2013; Nelson, Bos, Gunnar, & Sonuga-Barke, 2011; Van IJzendoorn et al., 2011).

Many primary studies have been conducted on the effects of severe neglect, especially on orphans adopted from developing countries. A number of systematic reviews and meta-analyses have been published, which synthesize the results of these studies. In the current study, a systematic review was conducted, limited to the identification of these previous systematic reviews and meta-analyses.

The aim of the systematic review described in this article was to determine the outcomes for individuals exposed to severe neglect in institutions, especially orphanages, in terms of adjustment across the life span. In this context, adjustment referred to physical health including growth failure and impaired neurobiological development, cognitive development, attachment, and mental health.

Method

Guidelines for conducting systemic reviews of systematic reviews were followed in developing a protocol for this review (Smith, Devane, Begley, & Clarke, 2011). The protocol specified the aim, databases to be searched, search terms, study selection criteria, supplementary manual search strategies, data extraction system, study quality assessment procedures, and data synthesis methods. The review was registered with PROSPERO at the Centre for Reviews and Dissemination, University of York (<https://www.crd.york.ac.uk/PROSPERO/registerReview.php#index.php>). The registration number is CRD42017065095.

Search Terms

Record titles, abstracts, and key words were searched in the electronic databases listed in the next section. Using appropriate Boolean operators, terms denoting *institutional care* were

combined with terms reflecting a range of possible negative developmental outcomes in the areas of physical health, cognitive development, attachment, and mental health. These were combined with the terms *systematic review* and *meta-analysis*. Where appropriate, Medical Subject Heading (MeSH) terms were used relating to adoption and human development as well as other relevant MeSH terms, which varied depending on the database. The search was conducted in July 2017. The following search string was used: ((looked after OR looked-after OR residential care) AND (child OR children)) OR (Institutionalize* OR institutionalise* OR Orphanage* OR Orphan OR "child in care" OR "children in care") OR [*Adoption Mesh term(s)*] AND (delay OR cogn* OR IQ OR reading OR attainment OR education OR school OR ADHD OR inattention OR attention OR ASD OR autism* OR attach* OR growth OR weight OR height OR circumference OR health OR illness OR psych* OR behavior? r* OR emotion* OR self-esteem OR clinic OR disorder) OR [*Human development Mesh term(s)*] AND ("systematic review" OR meta-analysis).

Databases

The following 10 databases were searched: PsycINFO, Medline, Academic Search Complete, Excerpta Medica database (EMBASE), Sociological Abstracts, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, Applied Social Sciences Index and Abstracts (ASSIA), Education Resource Information Centre (ERIC), and Cochrane Library.

Inclusion and Exclusion Criteria

Inclusion and exclusion criteria were used to identify high-quality systematic reviews and meta-analyses relevant to the research question. Papers were included if they reported systematic reviews and meta-analyses of longitudinal or cross-sectional controlled studies or single-group cohort primary studies of the effect of early institutional neglect or deprivation (without explicit reference to physical or sexual abuse) prior to adoption on physical health and growth, cognitive development, attachment, and mental health across the life span. For multiple publications of the same review, the one with the most complete data was included.

Systematic reviews and meta-analyses that did not meet three of the following four basic AMSTAR (Shea et al., 2009) systematic review quality criteria were excluded: (1) described an a priori design with a research question and inclusion criteria, (2) conducted a comprehensive literature search of at least two databases with appropriate search terms, (3) provided a table of characteristics of included studies (author, date, participant age and gender, type of maltreatment, and type of outcome), and (4) took the quality of studies into account in drawing conclusions. AMSTAR contains 11 criteria. A very high degree of confidence may be placed in conclusions from reviews and meta-analyses that meet all 11 criteria. The four basic AMSTAR criteria included in study selection criteria for the current review were chosen because conclusions from

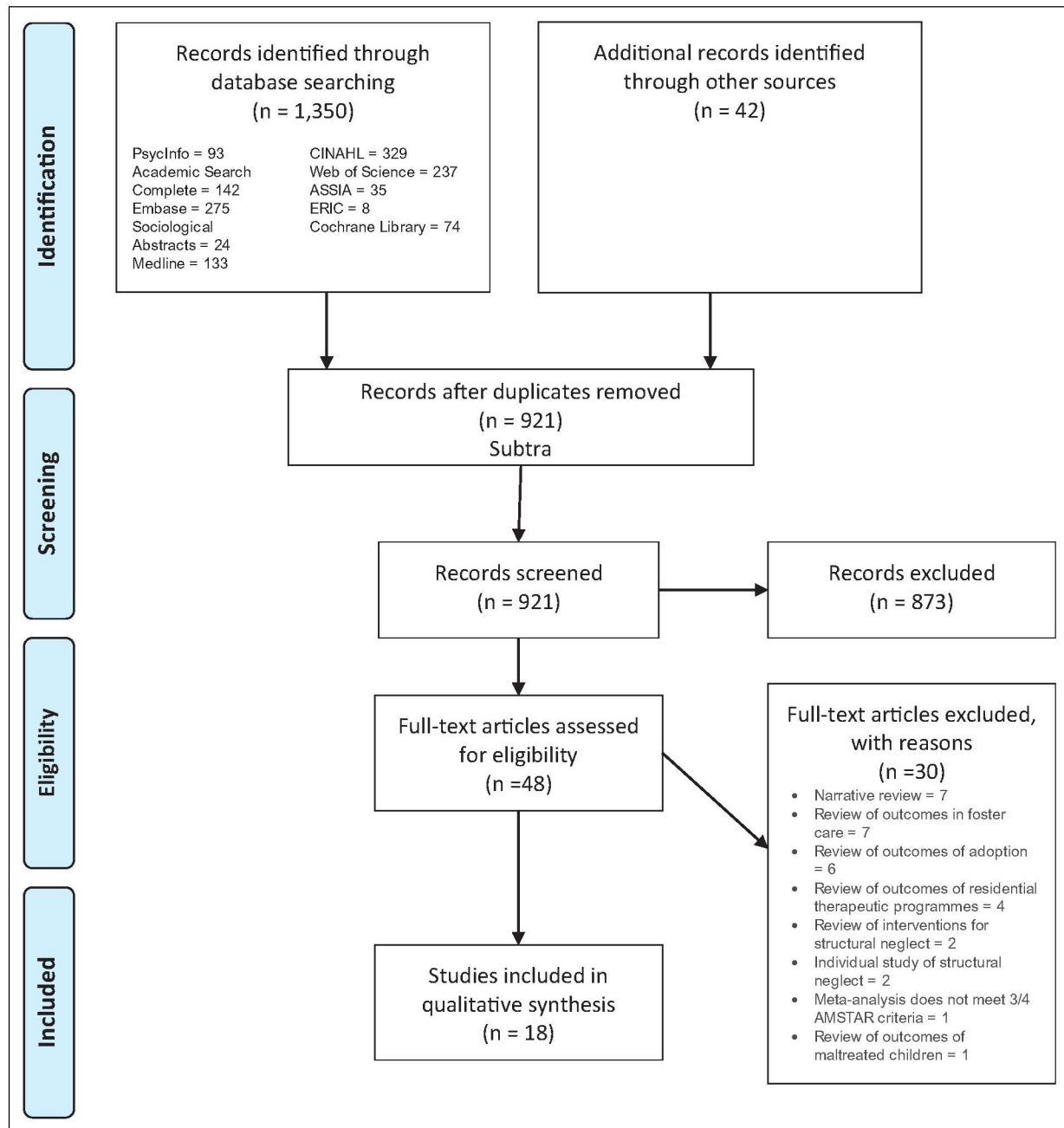


Figure 1. PRISMA flow diagram of literature search on outcomes of severe neglect.

review papers and meta-analyses that do not meet these basic criteria have limited validity.

Narrative, integrative, nonsystematic reviews, discursive papers, theoretical papers, papers describing individual quantitative or qualitative studies (rather than reviews of multiple studies), editorials, and letters were excluded. Papers not published in peer-reviewed journals were also excluded.

Search Process

Records identified in electronic searches were downloaded to EndNote (<http://endnote.com>). Covidence (<https://www.covi>

<https://www.covidence.org/>) was used for record screening, data extraction, and quality assessment. In addition to the electronic database search, a supplementary manual search was conducted. Bibliographies of review papers and tables of contents of relevant journals (*Trauma, Violence, and Abuse, Child Abuse and Neglect, Child Abuse Review, Child Maltreatment, Child Welfare, and Adoption and Fostering*) were searched. Established researchers in the field were also contacted.

Figure 1 contains a PRISMA (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009) flow diagram of the search process. Through electronic and manual searches, 921 separate records were identified after duplicates were removed.

When the titles and abstracts of these were screened, 48 relevant papers were downloaded for full-text screening. A final set of 18 papers, which met inclusion and exclusion criteria, were selected for review. The quality of these papers was assessed with AMSTAR (Shea et al., 2009).

Results

Interrater Agreement

Two research assistants were trained in using the systematic review protocol. Both research assistants independently conducted searches, study selection, data extraction, and study quality assessments. Disagreements were identified on the “resolve conflicts” page of Covidence, and these were resolved by discussion. Percentage agreement and Krippendorff’s α (Hayes & Krippendorff, 2007) were used to determine interrater agreement and reliability. For screening records and full-texts agreement, rates were 98% and 92%, respectively. For quality assessment agreement, rates ranged from 78% to 100% for AMSTAR items. There was 93% agreement for total AMSTAR scores and the Krippendorff’s α value was 0.86. For data extraction agreement, rates ranged from 67% to 100%, and the Krippendorff’s α values ranged from 0.88 to 1.00.

Study Sequence in Tables

Study quality ratings and data extracted from review papers were summarized in three tables. AMSTAR study quality scores are presented in Table 1. Study design features and sample characteristics are given in Table 2. Key findings are set out in Table 3. To aid synthesis of the large amount of information contained in 18 complex and comprehensive review papers, they have been grouped thematically in the same order within Tables 1–3. They have been grouped by the main type of outcome assessed (physical health, cognitive development, attachment, and mental health). It is noteworthy that in some studies which assessed cognitive development and mental health, multiple outcomes were assessed, as shown in the fourth column of Table 2. Within each group, papers have been sequenced, predominantly by the year of publication, although in some instances, sequences have been based on other features (such as author, specific outcomes assessed, where multiple outcomes were measured, or specific findings) to form a more coherent narrative.

Study Quality

AMSTAR review quality scores are given in Table 1. Ten reviews and meta-analyses were of high quality, with AMSTAR scores between 7 and 11. Eight reviews had AMSTAR scores between 3 and 6 and were of moderate quality. Fewer than half included pairs of raters for record screening and data extraction, provided a list of excluded studies, provided individual quality ratings of primary studies, and assessed risk of bias. Half or more described an a priori design, used a comprehensive search strategy, searched the gray literature, tabulated study characteristics, took study quality into

account when drawing conclusions, tested for study homogeneity, and took account of this in data analysis, and indicated conflicts of interests.

Study Design Features and Sample Characteristics

The 18 papers in the review were published between 2004 and 2017. Design features and sample characteristics are given in Table 2. Ten of the 18 papers focused on a single outcome. Two of these 10 focused on physical health outcomes, four on attachment, and four on mental health outcomes. The other eight were concerned with outcomes in the broad domain of cognitive development including IQ, school attainment problems, language delay, and specific learning disability. Four of these eight papers also addressed other outcomes including attachment and mental health. There were nine systematic reviews and nine meta-analyses. The number of databases searched in these studies ranged from one to nine with a mean of four. The most frequently searched databases were PsycINFO ($n = 15$) and PubMed/Medline ($n = 15$), followed by Web of Science ($n = 9$), Education Resources Information Centre (ERIC, $n = 8$), EMBASE ($n = 5$), PsycLIT ($n = 3$), Google Scholar ($n = 2$), and a number of databases, each of which were only searched in a single study. These included Applied Social Sciences Index and Abstracts, Academic Search Premier, British Nursing Index, Child Welfare and Adoption, ChildLink!, CINAHL, Communication and Mass Media Complete, Current Contents, Dissertation Abstracts, Evidence Based Medicine, Health Source: Nursing/Academic Edition, Online Contents, Professional Development Collection, Scientific Electronic Library Online, Science Citation Index, Science Direct, Scirus, Scopus, SocINDEX, Sociological Abstracts, and Social Science Information Gateway.

The number of studies (k) covered in papers included in this review ranged from 3 to 97 with a mean of 33. The total number of participants (N) within these review papers ranged from 466 to 1,295,767 with a mean of 97,178. Greater confidence may be placed in the validity of conclusions drawn from reviews where a larger proportion of studies involved strong research designs, especially controlled (rather than uncontrolled) studies. In the current review of 18 systematic reviews and meta-analyses, the proportion of controlled studies ranged from 40% to 100% with a mean of 88%.

Both children (under 18 years) and adults (over 18 years), and males and females were involved in studies covered in systematic reviews and meta-analyses reviewed in this article. The proportion of studies of mainly child samples ranged from 0% to 100% with a mean of 88%. The mean age of children in samples when they left care ranged from 1 to 3 years with an overall mean of 2 years. The mean age of participants when outcomes were assessed ranged from 2 to 31 with a mean of 9 years. The proportion of females in studies ranged from 42% to 75% with a mean of 53%. The proportion of studies in which participants were originally from developing countries in Eastern Europe, Asia, Africa, and South America ranged from 19% to 100% with a mean of 68%.

Table 1. AMSTAR Study Quality Scores in Literature Review on Outcomes of Severe Neglect.

Category and Theme	First Author	Date	AMSTAR Total	1. Described a Priori Design With Research Question and Inclusion Criteria	2. Used Two Independent Data Extractors and a Consensus Procedure for Disagreements	3. Used a Comprehensive Literature Search of at least 2 Databases With Appropriate Search Terms and Years of Search Indicated, and Manual Search of One of the Following: References of Studies Found, Review Papers, Current Contents, Textbooks, and Experts	4. Searched for Reports Regardless of Publication Type and Did Not Exclude Reports Based on Language or Publication Type (e.g., Theses, Report gray Literature)	5. Provided a List of Included and Excluded Studies (in the Refs or as an Electronic Link)	6. Provided Characteristics of Included Studies in a Table (Author, Date, Participant Age and Gender, Type of Maltreatment, and Type of Outcome)	7. Provided Ratings of the Scientific Quality of Studies (e.g., High or Low Quality) and Not just a Summary Score for All Studies	8. Took the Quality of Studies Into Account in Drawing Conclusions and Making Recommendations (e.g., Result Should Be Interpreted Cautiously Due to Poor Quality of Studies)	9. Provided a Test of Homogeneity (e.g., χ^2 or I^2) to Check Whether Results of Studies Could Be Validly Pooled, Used a Random Effects (Not a Fixed Effects) Model if Heterogeneity Was Present	10. Assessed Publication Bias (Using Funnel Plots or Egger Regression Test or Hedges-Olken Test, etc.) If There Were More Than 10 Studies	11. Acknowledged Sources of Support for Systematic Review and Included Studies (to Indicate Conflict of Interest)
Physical health	1. van IJzendoorn	2007	9	1	1	1	1	0	0	0	0	0	0	0
	2. Perego	2016	4	1	0	0	0	0	0	0	0	0	0	0
Cognitive development	3. Fensbo	2004	3	1	0	1	0	0	0	0	0	0	0	0
	4. van IJzendoorn	2005	9	1	1	1	1	0	0	0	0	0	0	0
	5. van IJzendoorn	2008	9	1	1	1	1	0	0	0	0	0	0	0
	6. Johnson	2006	3	1	0	1	0	0	0	0	0	0	0	0
	7. Christoffersen	2012	7	1	0	1	1	0	0	0	0	0	0	0
	8. Juffer	2014	3	1	0	1	0	0	0	0	0	0	0	0
	9. Sherr	2017	6	1	1	1	0	0	0	0	0	0	0	0
	10. Scott	2009	3	1	0	0	0	0	0	0	0	0	0	0
Attachment	11. van den Dries	2009	7	1	0	1	1	0	0	0	0	0	0	0
	12. Lionetti	2015	8	1	0	1	1	0	0	0	0	0	0	0
	13. Dumais	2014	7	1	0	1	0	0	0	0	0	0	0	0
	14. Garcia Quiroga	2016	8	1	1	1	1	0	0	0	0	0	0	0
Mental health	15. Juffer	2005	8	1	0	1	1	0	0	0	0	0	0	0
	16. Juffer	2007	8	1	1	1	1	0	0	0	0	0	0	0
	17. Latimer	2012	5	1	0	1	0	0	0	0	0	0	0	0
	18. Grant	2016	4	1	0	0	0	0	0	0	0	0	0	0
Total		18/18	100	18	15	15	9	1	16	2	16	9	8	11
%				100	33	83	50	6	89	11	89	50	44	61

Table 2. Study Design Features and Sample Characteristics in Literature Review on Outcomes of Severe Neglect.

Category	First Author	Year	Main Outcome	Data Synthesis	Databases Searched	No. of Databases Searched	No. of Primary Studies (k)	No. of Participants (N)	Percentage of Controlled Studies	Percentage of Mainly Child Sample Studies	Mean Age in Years When Left Care	Mean Age When Assessed	Percentage of Females	Percentage From Developing Countries
Physical health	1. van Ijzendoorn	2007	PH	MA	Medline, PsycINFO, ERIC, and Web of Science	4	33	68,403	100	100	2	6	—	64
	2. Perego	2016	PH	SR	PubMed, PsycINFO, and Google Scholar	3	34	2,650	100	97	—	8	—	100
	Cognitive development	3. Fensbo	2004	CD MH	SR	Medline and EMBASE	2	24	6,934	100	83	—	10	—
4. van Ijzendoorn		2005	CD LD	MA	Medline, PsycINFO, ERIC, Sociological Abstracts, and Current Contents	4	62	99,821	100	95	1	11	—	53
5. van Ijzendoorn	6. Johnson	2008	CD	MA	PubMed, PsycINFO, ERIC, Online Contents, and SSCI	5	42	4,078	100	100	—	3	—	48
		2006	CD AT	SR	Medline, EMBASE, ISI Web of Science, SOSIG, and Science Direct	5	27	1,414	100	100	—	6	42	52
7. Christoffersen	8. Juffer	2012	CD	MA	Medline, PubMed, PsycINFO, EMBASE, SSCI, and SocINDEX	5	16	2,400	100	88	2	14	—	19
			MH	SP										
			P											
9. Sherr	2017	CD	SR	Web of Science and Google Scholar	2	7	466	40	100	1	2	—	100	
		AT	SR	Medline and PsycINFO	2	66	17,118	98	98	—	8	45	86	
10. Scott	2009	LD	SR	Medline, PsycINFO, Academic Search Premier Communication and Mass Media Complete Professional Development, Collection Health Source: Nursing Academic Edition, Child Welfare and Adoption, Scirus, and Dissertation Abstracts	9	16	11,451	69	88	3	11	—	100	
Attachment	11. van den Dries	2009	AT	MA	PubMed, PsycINFO, ERIC, and Web of Science	4	39	7,072	100	77	—	7	—	27
			AT	MA	PubMed, PsycINFO, ERIC, Scopus, and Web of Science	5	10	818	100	100	—	3	—	80
12. Lionetti	2014	AT	MA	Medline and PsycINFO	2	16	701	78	100	—	4	—	67	
		AT	SR	Medline, PsycINFO, EMBASE, Web of Science ASSIA, SciELO, and ChildLink!	7	18	1,198	44	100	—	4	48	50	
Mental health	15. Juffer	2005	MH	MA	Medline, PsycLIT, and ERIC	3	98	185,746	100	93	1	10	54	—
			MH	MA	PubMed, PsycLIT, and ERIC	3	70	42,694	100	66	—	14	—	—
16. Juffer	2012	MH	SR	Medline, PsycLIT, PsycINFO, ERIC, EMBASE, BNI, CINAHL, EBM, SSCI, and Science Citation Index.	9	3	480	100	100	—	6	—	100	
		AT	SR	PsycINFO	1	19	1,295,767	62	0	2	31	75	80	
18. Grant	2016	MH	SR											
		AT	P											

Note. PH = physical health; CD = cognitive development; MD = motor development; LD = language development; AT = attachment; SP = school problems; MH = mental health; P = psychosocial adjustment; MA = meta-analysis; SR = systematic review with narrative synthesis; ERIC = Education Resource Information Centre.

Table 3. Key Findings from Literature Review on Outcomes of Severe Neglect.

First Author	Date	Key Findings
Physical health		
1. van IJzendoorn	2007	<ul style="list-style-type: none"> • In controlled studies, for international adoptees under 3 years, at the transition from orphanages to adoptive families, there was a significant association between the amount of time spent in institutional care and delayed physical growth assessed as height ($d = 1.71$ [0.82, 2.60] $k = 8$). • In adolescence ($d = -1.01$, $k = 23$) and early adulthood ($d = -0.70$, $k = 23$), adoptees who had spent their early years in institutions were of significantly shorter stature than peers in the general population. • Compared with normal controls, international adoptees who had been raised in institutions, at the transition from orphanages to adoptive families, showed significant delays in growth in terms of height ($d = -2.23$ [-2.62, -1.84] $k = 27$), weight ($d = -2.60$ [-3.13, -2.07] $k = 24$), and head circumference ($d = -2.22$ [-2.68, -1.76] $k = 15$). • Compared with normal controls, international adoptees showed severe growth delay at the transition from orphanages to adoptive placements; they were 3 kg lighter at 23 months and 8 cm shorter at 30 months. • After an average of 8 years with adoptive families, the adopted children showed substantial, but not complete catch-up in height and weight, and very little catch-up in terms of head circumference. • Those adopted after their first birthday showed less catch-up in weight than those adopted before 12 months. • Children in these studies were adopted from Eastern Europe, Asia, and South America to the United States and Western Europe.
2. Perego	2016	<ul style="list-style-type: none"> • In 34 controlled brain imaging and other neuroscientific studies, early deprivation in institutional care was associated with reduced brain volume and decreased cortical activity. It was also associated with larger amygdala volume, altered frontal and limbic activity, white matter abnormalities, especially in the connections between frontal regions and amygdala, and irregular hormone levels. • These brain abnormalities probably subserve difficulties shown by institutionalized children in the areas of cognitive development on the one hand and attachment and mental health on the other.
Cognitive development		
3. Fensbo	2004	<ul style="list-style-type: none"> • In studies of international adoption, children who spent longer periods in orphanages before adoption had significantly poorer adjustment on indices of cognitive development, attachment security, and mental health.
4. van IJzendoorn	2005	<ul style="list-style-type: none"> • In controlled studies, compared with adoptees, children reared in orphanages had significantly lower IQs ($d = -1.17$ [-1.36, -0.99] $k = 6$) and more school attainment problems ($d = -0.55$ [-0.88, -0.21] $k = 3$). • Compared with normal controls, when assessed in later childhood or adolescence, significantly more adopted children who had lived in orphanages prior to adoption had language delays ($d = 0.09$ [0.04, 0.14] $k = 14$), school attainment problems ($d = 0.19$ [0.14, 0.25] $k = 52$), and specific learning disabilities ($d = 0.55$ [0.35, 0.75] $k = 8$) but not lower IQ. The absence of a difference in IQ may have reflected the fact that adopted children initially reared in orphanages caught up with their peers in the area of cognitive development as a result of living in an adoptive family. • Reviewed studies were conducted in the United States, Canada, United Kingdom, Norway, Sweden, Denmark, France, Belgium, the Netherlands, Spain, Greece, Chile, Australia, New Zealand, and Israel. • Children were adopted from the United States, United Kingdom, France, Spain, Greece, Israel, South America, Columbia, Asia, Korea, India, Sri Lanka, Bangladesh, Vietnam, Cambodia, Thailand, Lebanon, Romania, and Russia.
5. van IJzendoorn	2008	<ul style="list-style-type: none"> • In controlled studies of children under 12 years of age, those raised in institutions had IQ's that were 20 points lower than those of children raised in birth or foster families (84 vs. 104) and this difference was significant ($d = 0.74$ [0.48, 1.01] $k = 75$). • There were significant associations between low IQ on the one hand and being placed in institutions before the age of 1, being assessed before the age of 4, and residing in countries with a low living standard on the other. • Reviewed studies were conducted in the United States, Canada, United Kingdom, France, Norway, Switzerland, Sweden, Greece, Turkey, Israel, India, Ethiopia, Kenya, Eritrea, Romania, Lebanon, Ukraine, Iran, and Russia.
6. Johnson	2006	<ul style="list-style-type: none"> • In controlled studies, compared with children raised in families with a primary caregiver, significantly more children raised in institutions prior to 5 years without a primary caregiver had delayed cognitive development, insecure attachment, mental health difficulties, and psychosocial adjustment problems, especially managing relationships with peers and teachers.
7. Christoffersen	2012	<ul style="list-style-type: none"> • In controlled studies, individuals raised in orphanages or foster care had significantly poorer cognitive development indexed by lower IQs ($d = 1.40$, $k = 4$) and significantly more school problems ($OR = 0.54$ [0.38, 0.77] $k = 4$) and mental health problems ($OR = 0.61$ [0.41, 0.91] $k = 4$) but not lower self-esteem than controls who were raised within adoptive families.

(continued)

Table 3. (continued)

First Author	Date	Key Findings
		<ul style="list-style-type: none"> • There was a mean difference of 17 IQ points ([11.2, 23.1] $k = 4$) between children raised in orphanages or in care on the one hand and those raised in adoptive families on the other. • Children raised in orphanages or foster care had a 1.85 times higher risk of school problems such as being in a special class or repeating a year or having learning disabilities than those raised in adoptive families. • Children raised in orphanages or foster care had a 1.64 times higher risk of developing mental health problems than those raised in adoptive families. • Remaining in orphanages or foster care was a risk factor and being raised in an adoptive family was a protective factor. • Reviewed studies were conducted in Organization for Economic Cooperation and Development countries such as the United States, United Kingdom, Canada, Denmark, Sweden, France, Spain, and New Zealand, as well as developing countries such as Chile, Lebanon, and India.
8. Juffer	2014	<ul style="list-style-type: none"> • In five of the seven studies, Chinese children showed significant motor and cognitive delays at the transition from orphanages or foster families to adoptive families. Within 6 months, their functioning was within the normal range, and within 2 years, their catch-up was complete compared to normal controls. • In both studies of attachment, at age 6 and 12 months, Chinese adoptees showed significantly higher rates of insecure disorganized attachment compared to normal controls, and by 2 years had shown some but not completed catch-up in this area. • Less severe developmental delays were shown by Chinese adoptees from foster homes compared with those from orphanages.
9. Sherr	2017	<ul style="list-style-type: none"> • Reviewed studies were conducted in the United States, Canada, and the Netherlands. • 42 of the 45 controlled studies that assessed cognitive development found a significant association between early institutional care and cognitive delay. • 41 of the 43 studies that assessed psychosocial adjustment found a significant association between early institutional care and psychosocial adjustment.
10. Scott	2009	<ul style="list-style-type: none"> • Across 16 studies of internationally adopted and formerly institutionalized children, 9 found good language outcomes by the school-age years, 3 found language difficulties by school-age years, and 4 reported variable outcomes for formerly institutionalized adoptees. • Reviewed studies were conducted in the United States, United Kingdom, Norway, Sweden, and Belgium. • Adoptees came from Korea, India, Vietnam, Cambodia, Thailand, Romania, Columbia, China, Greece and had been in institutions for 0–6 years.
Attachment		
11. van den Dries	2009	<ul style="list-style-type: none"> • Compared with adoptees, children reared in orphanages had significantly higher rates of insecure disorganized attachments (73% vs. 31%, $k = 13$). • Compared with children raised in birth families, adoptees (who had spent their early years in orphanages) had significantly higher rates of insecure disorganized attachments (31% vs. 15%, $k = 26$; $d = 0.36$ [0.04, 0.68] $k = 11$). • Children who were raised in orphanages and adopted before 12 months of age were as securely attached as children raised in birth families, whereas children raised in orphanages and adopted after their first birthday had significantly higher rates of insecure attachments compared with children raised in birth families ($d = 0.80$ [0.49, 1.12] $k = 5$). • Adopted and fostered children had similar rates of insecure disorganized attachments. • Reviewed studies were conducted in the United States, Canada, United Kingdom, Australia, Sweden, the Netherlands, Italy, Poland, Portugal, and Greece.
12. Lionetti	2015	<ul style="list-style-type: none"> • Across 10 studies, compared with family-reared controls, significantly more children reared in institutions had insecure disorganized attachments (54% vs. 21%) and insecure organized attachments (28% vs. 24%), and significantly fewer had secure attachments (18% vs. 56%). • Children reared in Eastern European institutions were more likely to have insecure disorganized and insecure organized attachments. • Children who entered institutions before their first birthday and whose attachments were assessed before 3 years were more likely to have insecure disorganized attachments. • Reviewed studies were conducted in Portugal, Greece, China, Ukraine, Chile, Japan, Petersburg, and Bucharest.
13. Dumais	2014	<ul style="list-style-type: none"> • In controlled studies, significantly more infants in orphanages had insecure attachments ($d = 0.75$ [0.43, 1.11] $k = 7$) and insecure disorganized attachments ($d = 0.75$ [0.43, 1.06] $k = 7$) than normal controls. • In orphanages, 79% of infants had insecure attachments, 53% had insecure disorganized attachments, and 26% had insecure organized attachments. • Compared to children in orphanages over 3 years of age, significantly more of those under 3 had insecure attachments.

(continued)

Table 3. (continued)

First Author	Date	Key Findings
14. Garcia Quiroga	2016	<ul style="list-style-type: none"> • Significantly more infants in orphanages in Eastern Europe and Asia had insecure attachments than in Western Europe. • A model was developed based on the reviewed studies that explained the association between severe neglect within orphanages and infants' insecure disorganized attachment. In this model, it is proposed that: • Severe neglect occurs in institutions with a high ratio of infants to caregivers, high caregiving staff turnover, and an adverse organizational climate shared by caregivers and managers. • Severe neglect occurs where caregivers show extreme insensitivity, a high level of threatening behavior, and provide a low quality of care. This caregivers' behavior is associated with them having an insecure adult attachment style, and mental health and socioeconomic difficulties. • Infants' vulnerability to develop an insecure disorganized attachment style is associated with their personal characteristics (genetic vulnerabilities and gender) and preinstitutional factors (perinatal adversities, maltreatment within the birth family, and relationships with birth parents). • In controlled studies, children living in institutional and foster care had significantly higher rates of insecure attachments than children raised in birth families (61% vs. 49%). • Compared with children raised in foster care, children raised in institutions had significantly higher rates of insecure attachments (79% vs. 41%), insecure disorganized attachments (44% vs. 23%), and insecure organized attachments (35% vs. 18%). • Children were significantly more likely to have insecure attachments in institutions with a high ratio of children to caregivers, limited resources, and where caregivers showed limited sensitivity to children's needs. • Reviewed studies were conducted in the United States, Canada, Israel, Greece, France, Japan, Romania, Ukraine, Chile, and Africa.
Mental health 15. Juffer	2005	<ul style="list-style-type: none"> • International adoptees who had experienced preadoption adversity in orphanages had significantly more mental health problems than international adoptees who had not experienced extreme deprivation ($d = 0.18$ vs. $d = 0.09$). Effect sizes for each of these groups were based on comparisons with nonadopted controls. • Compared with nonadopted controls, international adoptees had significantly more mental health difficulties ($d = 0.11$ [0.09, 0.13] $k = 47$). • Compared with nonadopted controls, adoptees (both domestic and international) had significantly more mental health difficulties ($d = 0.18$ [0.12, 0.24], $k = 101$) and were overrepresented in referrals to mental health services ($d = .72$ [0.57, 0.86] $k = 36$). • Compared with nonadopted controls, international adoptees had significantly fewer mental health problems than domestic adoptees ($d = 0.11$ vs. $d = 0.20$) and were less often referred to mental health services than domestic adoptees ($d = 0.37$ vs. $d = 0.81$). This was an unexpected finding. • Included studies were conducted in the United States, United Kingdom, Canada, Belgium, Finland, France, Germany, Greece, the Netherlands, Norway, Spain, Sweden, Australia, and New Zealand.
16. Juffer	2007	<ul style="list-style-type: none"> • In controlled studies conducted in the United States, Canada, and Spain, the self-esteem of children reared in institutions was significantly lower than that of adopted children ($d = -0.58$ [-0.84, -0.33] $k = 3$). • There was no significant difference between the levels of self-esteem of adopted and nonadopted children ($d = 0.01$ [-0.06, 0.08] $k = 88$) or between transracial and same-race adoptees ($d = -0.02$ [-0.12, 0.09] $k = 18$). • Included studies were conducted in the United States, United Kingdom, Canada, Spain, Sweden, Finland, the Netherlands, Germany, Italy, Israel, Australia, and New Zealand.
17. Latimer	2012	<ul style="list-style-type: none"> • This systematic review identified studies that examined links between a wide range of risk factors in the prenatal, postnatal, and infancy periods and a wide range of childhood disorders. • In both studies that examined the link between early institutional deprivation and attention deficit hyperactivity disorder, a significant association was found. • In the single study that examined the link between early institutional deprivation and reactive attachment disorder, a significant association was found.
18. Grant	2016	<ul style="list-style-type: none"> • In some of the controlled and single-cohort quantitative studies and qualitative studies of international adult adoptees in this review, adoptees had higher rates of mental health problems, and these were associated with adverse experiences in preadoption institutional care.

Note. Odds ratio (OR) and 95% confidence intervals (CIs) are given in square brackets. In some instances, ORs and CIs were computed based on the data in articles. $d =$ Cohen's d effect size and 95% CIs are given in square brackets. Where studies reported Pearson's r effect sizes, these were converted to Cohen's d effect sizes to aid comparison of effect sizes from different studies. All reported OR and d values are significant at $p < .05$. $k =$ number of studies.

Overlap in Primary Studies Included in Review Papers

There was overlap in the primary studies included in systematic review papers and meta-analyses selected for the current systematic review of review papers. In total, there were 451 independent studies reviewed in these 18 systematic review and meta-analyses. The percentage of review papers in which each primary study was included ranged from 6% to 28%. The percentage of all 451 independent studies included in each review paper ranged from 1% to 22%. In total, across all 451 independent studies, there were 1,749,211 participants. Of these, 169,204 had experienced severe neglect.

Outcomes for Individuals Who Experienced Severe Neglect

Key findings from 18 systematic reviews and meta-analyses on studies of the outcomes for individuals who experienced severe neglect are given in Table 3. Most participants in primary studies covered in these reviews were raised in poorly resourced orphanages and other institutions where they experienced severe neglect. In the section on Study Design Features and Sample Characteristics, it was noted that in these reviews, about two thirds (68%) of participants were originally from developing countries. Some reviews included studies of both domestic and international adoption, while others focused exclusively on the latter. In this context, domestic adoption refers to adoption from an institution to a family within a single country (e.g., the United Kingdom). International adoption, in contrast, refers to adoption from orphanages in developing countries into families in developed countries. International adoptees may have experienced greater severe neglect than domestic adoptees because orphanages in developing countries tend to be less well resourced than those in developed countries. In this context, developing countries refers to those in Eastern Europe, Asia, Africa, and South America. Developed countries refer to those in Europe and North America as well as in Australia and New Zealand.

Some participants in the primary studies in the reviews summarized in Table 3 were children exposed to severe neglect early in life and then adopted, while others were raised to adulthood in institutions. Reviews of controlled studies of adoptees provide information on the outcomes of severe neglect at the transition from institutional care to adoptive families compared with children raised in birth families. They also shed light on the degree to which these children catch-up with children raised in birth families over their time living in adoptive families. Controlled studies of individuals raised to adulthood in poorly resourced institutions indicate the outcomes of experiencing severe neglect throughout childhood and adolescence.

Physical Health

In the domain of physical health, one systematic review of physical growth delay in international adoptees who had been

raised in orphanages care (van IJzendoorn, Bakermans-Kranenburg, & Juffer, 2007) and one meta-analysis of the neurobiological correlates of psychosocial deprivation in children (Perego, Caputi, & Ogliari, 2016) were identified.

van IJzendoorn, Bakermans-Kranenburg, and Juffer (2007) conducted a meta-analysis of 33 controlled studies of children adopted from poorly resourced orphanages in Eastern Europe, Asia, and South America to adoptive families in the United States and Western Europe. They concluded that compared with normal controls, international adoptees who had been raised in institutions showed significant delays in growth in terms of height, weight, and head circumference. At about 2 or 3 years of age, shortly after making the transition from orphanages to adoptive families, they were 3 kg lighter and 8 cm shorter than normal controls. In adolescence and early adulthood, adoptees who had spent their early years in institutions were of significantly shorter stature than peers in the general population. After an average of 8 years with adoptive families, adopted children showed substantial, but not complete catch-up in height and weight, and very little catch-up in terms of head circumference. Those adopted after their first birthday showed less catch-up in weight than those adopted before 12 months.

In 34 controlled brain imaging and other neuroscientific studies, Perego, Caputi, and Ogliari (2016) concluded that early deprivation in institutional care was associated with reduced brain volume and decreased cortical activity. It was also associated with larger amygdala volume, altered frontal and limbic activity, white matter abnormalities, especially in the connections between frontal regions and amygdala, and irregular hormone levels. They concluded that these brain abnormalities may subserve difficulties shown by institutionalized children in the areas of cognitive development on the one hand and attachment and mental health on the other.

Cognitive Development

Eight systematic reviews and meta-analyses of severe neglect and delayed cognitive development were identified (Christoffersen, 2012; Fensbo, 2004; Johnson, Browne, & Hamilton-Giachritsis, 2006; Juffer, Finet, Vermeer, & van den Dries, 2014; Scott, 2009; Sherr, Roberts, & Gandhi, 2017; van IJzendoorn, Juffer, & Poelhuis, 2005; van IJzendoorn, Luijk, & Juffer, 2008). In this context, delayed cognitive development was indexed by lower IQ, school attainment problems, specific learning difficulties, and language delay.

All seven reviews that investigated IQ found a significant association between this outcome and severe neglect (Christoffersen, 2012; Fensbo, 2004; Johnson et al., 2006; Juffer et al., 2014; Sherr et al., 2017; van IJzendoorn et al., 2005, 2008). For example, in meta-analyses by van IJzendoorn, Luijk, and Juffer (2008) and Christoffersen (2012), on average, the IQs of children raised in institutions were 17–20 IQ points lower than those of children raised in families. van IJzendoorn et al. (2008) found that lower IQs of children who had experienced severe neglect were associated with being placed in institutions before the age of 1 year,

being assessed before the age of 4 years, and residing in developing countries with a low living standard. Adoptees who had experienced severe neglect in orphanages in their early life showed considerable catch-up during childhood following adoption, such that their IQs became similar to those of children raised in birth families and significantly higher than children who remained in orphanages (Christoffersen, 2012; Juffer et al., 2014; van IJzendoorn et al., 2005).

School attainment problems were investigated in two reviews, and in both of these, this outcome was associated with severe neglect (Christoffersen, 2012; van IJzendoorn et al., 2005). In the only review that investigated the issue, van IJzendoorn, Juffer, and Poelhuis (2005) found a significant association between severe neglect and specific learning difficulties.

Two reviews addressed developmental language delay. In a meta-analysis, van IJzendoorn et al. (2005) found a small but significant association between developmental language delay and severe neglect. However, in a systematic review, Scott (2009) reached no definitive conclusion on this issue. Across 16 primary studies of internationally adopted and formerly institutionalized children, nine found good language outcomes by school-age years, three found language difficulties by school-age years, and four reported variable outcomes for formerly institutionalized adoptees.

Attachment

Seven systematic reviews and meta-analyses of severe neglect and attachment were identified (Dumais, Cyr, & Michel, 2014; Fensbo, 2004; Garcia-Quiroga & Hamilton-Giachritsis, 2016; Johnson et al., 2006; Juffer et al., 2014; Lionetti, Pastore, & Barone, 2015; van den Dries, Juffer, van IJzendoorn, & Bakermans-Kranenburg, 2009), three of which also addressed outcomes in other areas including cognitive development and mental health (Fensbo, 2004; Johnson et al., 2006; Juffer et al., 2014). All of these reviews concluded that there was a significant association between severe neglect and insecure attachment, especially insecure disorganized attachment. Across four studies that provided sufficient aggregated data, 44–73% of survivors of institutional neglect had insecure disorganized attachments compared with 15–21% of children raised in birth families (Dumais et al., 2014; Garcia-Quiroga & Hamilton-Giachritsis, 2016; Lionetti et al., 2015; van den Dries et al., 2009). Insecure disorganized attachments were more common among young children (Dumais et al., 2014; Lionetti et al., 2015) who spent more than their first year of life experiencing severe neglect (Van den Dries et al., 2009) in institutions in developing rather than developed countries (Dumais et al., 2014; Lionetti et al., 2015), with a high ratio of children to caregivers, limited resources, and where caregivers showed limited sensitivity to children's needs (Garcia Quiroga & Hamilton-giachritsis, 2016).

Mental Health

Six systematic reviews and meta-analyses of severe neglect and mental health were identified (Fensbo, 2004; Grant, Rushton,

& Simmonds, 2016; Johnson et al., 2006; Juffer & van IJzendoorn, 2005, 2007; Latimer et al., 2012). Two of these also addressed outcomes in the areas of cognitive development and attachment (Fensbo, 2004; Johnson et al., 2006). All of these reviews concluded that there was a significant association between severe neglect in orphanages, in both developing and developed countries, and mental health problems. Juffer and van IJzendoorn (2005) found that adoptees, many of whom who had experienced severe neglect in orphanages, were over-represented in referrals to mental health services. Latimer et al. (2012) found significant associations between severe neglect and two particular mental health problems: attention deficit hyperactivity disorder and reactive attachment disorder. Juffer and van IJzendoorn (2007) found that the self-esteem of children reared in institutions, many of which were characterized by severe neglect, was significantly lower than that of adopted children.

Conclusions

A summary of key findings from this review is given below along with implications for research policy and practice. While robust, these conclusions should be tempered by a consideration of the scientific quality of the studies on which they are based. Ten of the 18 (56%) reviews and meta-analyses in our review of reviews were of high quality, with AMSTAR scores between 7 and 11. Eight (44%) had AMSTAR scores between 3 and 6 and were of moderate quality. The primary studies included in systematic reviews and meta-analyses were predominantly controlled and relatively well designed, allowing confidence to be placed in their results.

Summary of Key Findings

The focus of this review was on outcomes of individuals who had experienced severe neglect during infancy and early childhood in poorly resourced institutions. There were significant associations between the experience of severe neglect in large congregate institutions such as orphanages and adjustment in the domains of physical health, cognitive development, attachment, and mental health. It is highly probable that severe neglect largely accounts for these adverse outcomes.

Physical health outcomes. Severe neglect was associated with short-stature, low-weight, and smaller head circumference. At about 2 or 3 years of age shortly after the transition from orphanages to adoptive families, children exposed to severe neglect were 3 kg lighter and 8 cm shorter than children raised in birth families. Severe neglect was also associated with abnormal neurobiological development affecting a range of brain structures and functions, implicated in cognitive and psychosocial difficulties. Children who had experienced severe neglect in orphanages and were placed in adoptive families showed a large degree of relatively rapid catch-up in weight and height but a lesser degree and slower rate of catch-up occurred in head circumference.

Cognitive development outcomes. Severe neglect was associated with delayed cognitive development as indexed by lower IQ, school attainment problems, specific learning disorders, and possibly by language delay. On average, the IQs of children raised in institutions were 17–20 IQ points lower than those of children raised in families. Children who had experienced severe neglect in orphanages and were placed in adoptive families showed a large degree of relatively rapid catch-up in IQ.

Attachment outcomes. Severe neglect was associated with insecure attachment, especially insecure disorganized attachment. Rates of disorganized attachment were about 3 times higher in survivors of institutional neglect compared with children raised in birth families. Disorganized attachment is a risk factor for later difficulties making and maintaining relationships across the life span. Children who had experienced severe neglect in orphanages and were placed in adoptive families showed long-term attachment insecurity, especially insecure disorganized attachment.

Mental Health outcomes. Severe neglect was associated with higher rates of mental health problems and mental health service usage.

Risk and protective factors. Significant, but incomplete, developmental catch-up occurred when children exposed to severe neglect were adopted. The degree and rate of catch-up depended on the outcome domain, the severity and duration of severe neglect, and the presence of a range of personal and contextual risk and protective factors. A large degree of relatively rapid catch-up occurred in weight, height, and IQ. A lesser degree and slower rate of catch-up occurred in head circumference and attachment security. Exposure to severe deprivation over longer time periods in understaffed, poorly resourced institutions in underdeveloped countries was a risk factor for poorer outcomes. Early adoption was a protective factor for better outcomes.

These conclusions are consistent with those of previous reviews of systematic reviews and meta-analyses (Juffer & van IJzendoorn, 2012; McCall & Groark, 2015).

Implications for Research, Policy, and Practice

Prevention policies should aim to eliminate large under-resourced congregate care institutions for infants (Hamilton-Giachritsis & Browne, 2012). In taking steps toward this, policies should aim to adequately resource congregate care institutions to meet children's developmental needs for a secure and adequately resourced living environment, nutrition, stimulation, and attachment to a stable primary caregiver with adequate parenting skills and training.

There are certain minimum standards essential for healthy child development. All children require a safe, secure, clean, and structurally robust residence that is not overcrowded. It should have adequate heat, light, sleeping, playing, feeding,

washing, and sanitation facilities. All children require clean and appropriate bedding, clothing, and play equipment. They require a regular balanced diet appropriate to their developmental stage and access to regular health care. They require stable attachments to one or two skilled primary caregivers. This means that staffing in orphanages should be stable, and child/carer ratios should be low, for example, 1–4:1. This also means that institutional childcare staff require careful selection and training. On a daily basis, all children living in institutions require prolonged periods of interaction with their primary carers and with other children, and access to recreational and educational opportunities appropriate to their developmental stage.

Early placement in adoptive or foster families, with access to routine physical and mental health-care service available in developed countries, is the most viable effective intervention for child survivors of severe neglect in childcare institutions. Future studies in this area should assess the full range of outcomes considered in this article along with risk and protective factors. Study designs should include adopted and non-adopted survivors of severe neglect as well as normal controls, and cases should be followed up into adulthood.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This article was supported by funding from the Scottish Child Abuse Inquiry.

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