

BMJ Open Physical health of care-experienced young children in high-income countries: a scoping review protocol

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To cite: Bradford DRR, Allik M, McMahon AD, *et al.* Physical health of care-experienced young children in high-income countries: a scoping review protocol. *BMJ Open* 2022;**12**:e063648. doi:10.1136/bmjopen-2022-063648

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-063648>).

Received 06 April 2022
Accepted 25 August 2022



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ABSTRACT

Introduction Care-experienced children have poorer health, developmental, and quality of life outcomes across the lifespan compared to children who are not in care. These inequities begin to manifest in the early years. The purpose of the proposed scoping review is to collate and synthesise studies of the physical health of young care-experienced children. The results of the review will help map the distribution of health outcomes, identify potential targets for intervention, and assess gaps in the literature relating to this group.

Methods and analysis We will carry out a scoping review of the literature to identify studies of physical health outcomes in care-experienced children. Systematic literature searches will be carried out on the MEDLINE, CINAHL and Web of Science Core Collection databases for items indexed on or before 31 August 2022. Studies will be included where the participants are aged 3 months or greater and less than 6 years. Data elements extracted from included studies will include study objectives, health outcomes, participant demographics, care setting characteristics and bibliographic information. The results of the review will be synthesised and reported using a critical narrative approach. Comparisons between care and non-care populations will be reported if sufficient studies are identified.

Ethics and dissemination Data will be extracted from publicly available sources, so no additional ethical approval is required. Results will be published in a peer-reviewed journal article. Furthermore, they will be shared in summary reports and presented to local authorities, care organisations and other relevant stakeholders that can influence healthcare policy and procedure relating to young children in care.

BACKGROUND

A significant number of infants require support beyond that which their biological parents can provide. To have these additional support needs met, some children come formally under the care of social care services provided by local or national government agencies. This may mean receiving extra input from health and social care workers while remaining in the parental home; living in kinship care; living in foster care; being permanently adopted by non-biological parents or living in residential care homes.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The scoping review method facilitates the synthesis of evidence from varied study designs concerning physical health outcomes.
- ⇒ The prospective review will follow validated methods for literature screening, data extraction and reporting to maximise transparency and replicability.
- ⇒ Exclusion of grey literature and articles without English-language abstracts are limitations of the prospective review.

The proportion of children in care varies internationally due to differing legal and cultural approaches. Examples from high-income countries include 14 per 1000 children in Scotland,¹ 6.7 per 1000 in England² and 4.0 per 1000 infants in Sweden.³ These cross-sectional census figures underestimate the number of children who have ever been in care since there is a constant flux of children into and out of care. Although care-experienced children constitute a small portion of the population of children in high-income countries, these children deserve increased attention due to the additional challenges they face to achieving good health.⁴ There is a clear motivation to provide support to improve health outcomes for such children.

Children with care experience have poorer outcomes in many domains of health and well-being compared with their peers in the non-care population.^{5–9} Mental ill health is prevalent across the lifespan in this group and has been the subject of many reviews.^{10–12} Similarly, developmental delay and disorder in socioemotional, cognitive, and behavioural domains are common in care-experienced children and these topics have been reviewed previously.^{12–14} The literature on physical health and physical development problems in care-experienced children is less well established, particularly for those in the early years. Despite physical ill health problems being highly prevalent in this population,^{15–18} these

health outcomes have not yet been the subject of a review. Bringing together the results of studies which investigated this topic is therefore a useful exercise and is the purpose of the present work. Our results will help identify common conditions affecting children in care, highlight health conditions and inequalities that may benefit from the development of specific interventions and identify potential gaps in the literature to be addressed.

The results of studies comparing physical health outcomes in care-experienced children and children who have never been in care are less clearly polarised than those for mental health and socioemotional, cognitive, and behavioural development, where the former group are unequivocally worse off.^{17 19 20} In the physical domain, there are instances where care-experienced children are observed to have a reduced disease burden, although these are typically for less severe disease. For example, asthma has been found to be less prevalent in samples of children in care than controls from the non-care population.^{20 21} By contrast, Turney and Wildeman reported a significantly higher crude proportion of children aged 0–17 years in foster care with asthma.¹⁷ However, after adjusting for birth and socioeconomic factors, the difference in proportion compared with the non-care group became negligible. Fleming *et al* also reported no significant difference in asthma prevalence (after adjustment for birth and socioeconomic factors) in their population-level administrative health data study of school-aged children.¹⁹ Reviewing the available literature can help to clarify such ambiguities. There is, of course, some risk that differences between care-experienced and other children in the prevalence of diagnosed health conditions are due to differences in health-seeking behaviour rather than truly better health. Regardless, improved knowledge about differences in the prevalence of physical ill health between children in care and children in the general population is needed to understand potential associations and/or causes.

Some differences in physical health conditions between children in care and children in the general population are conflicting or ambiguous. However, the subset of conditions caused by, or strongly associated with, abuse and neglect—such as bone fractures and poisonings—are evidently more common in care-experienced populations.^{3 22–24} This is unsurprising since abuse and neglect are common reasons for a child becoming formally cared for.^{25–27} Although these traumatic experiences have clear and well-documented consequences for socioemotional development,²⁸ there are also consequences for physical health. Hospitalisations due to both injury and self-harm have been found to be more common in school-aged children in care than in their non-care peers, after adjusting for a range of socioeconomic and maternal factors.¹⁹ Neglectful parenting also has consequences for conditions where proactive health behaviours are vital. For example, dental health problems were significantly more frequently identified in children in care than in the general population during a universal

dental health screening programme in Scotland.⁶ This difference remained after adjustment for socioeconomic status and echoes previous studies reporting increased dental health issues in this group.^{16 18 21 29} Similarly, care-experienced children are more likely to have incomplete immunisation, or to have been fully immunised at older ages.^{16 18} These examples highlight that children in care face unique challenges to their health. These challenges are compounded by factors deleterious to health that are associated with poorer socioeconomic circumstances which care-experienced children more often reside in.^{6 30} Identification and mitigation of the consequences of these unique risk factors can help to improve health policy and practices relating to this group.

Infancy and childhood are a period where growth and development are highly sensitive to factors in the individual's environment. Being subject to emotional and physical adversity during this period is associated with long-term negative physical health outcomes.^{31 32} If untreated or uncorrected during early childhood, some malleable impairments to health may become permanent. Strabismus (misalignment of the visual axes of the eyes) is an example of such a correctable condition. Intervention to treat this condition in the early years is key to avoiding this becoming a lifelong issue.³³ Additionally, children who enter care early in life also tend to experience different pathways to those becoming cared for during middle childhood or adolescence.³⁴ Taken together, this suggests children with experience of formal care in the early years may exhibit a distinct cluster of healthcare needs compared to similarly-aged children who are not in care. Furthermore, their healthcare needs likely differ from children who first become cared for later in life. By investigating physical health in the younger care-experienced group in more detail, it is possible that opportunities for early intervention can be better exploited to improve subsequent well-being.

Study objectives

Previous reviews and meta-analyses have looked at socioemotional and behavioural development,^{12 13 28 35} mental health,^{10 12 36} effectiveness of interventions and engagement with healthcare providers,^{37–39} or have focused on specific subgroups of children with care-experience (e.g., children with prenatal substance exposure,⁴⁰ young adults leaving care).⁴¹ Based on preliminary searches of MEDLINE and the Cochrane Database of Systematic Reviews, it appears that there has not been a review of physical health outcomes in young care-experienced children to date. The present review aims to fill that gap. A scoping review is an appropriate methodology for this purpose. This type of review can establish the scope and common themes within existing research into the topic and indicate which physical health conditions are frequently observed in young care-experienced children. This will be of interest to policy-makers and healthcare practitioners.^{42–44} Furthermore, under-researched health conditions may be identified by comparing the results of

this review with the more substantial body of literature on the physical health of young children who are not in care.

Concept definition

This review will address the literature on physical health. We have defined physical health conditions as those primarily rooted or expressed in physiology. While we recognise that psychiatric conditions and socioemotional, cognitive, and behavioural developmental conditions can have organic and/or physiological aspects, these conditions have been previously reviewed (see above). In addition, the proposed review is restricted to children in care in high-income countries. This is because these children face notably different types of physical health conditions to those in low-income and middle-income countries.^{45 46}

METHODS AND ANALYSIS

This review has been designed in line with the Joanna Briggs Institute (JBI) guidelines for carrying out scoping reviews.⁴⁷ It is also informed by Arksey and O'Malley's original framework⁴² and the additional guidance laid out by Levac, Colquhoun and O'Brien.⁴³ The five steps of the review procedure of Arksey and O'Malley are detailed below. The JBI framework aligns with the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension (PRISMA-ScR) statement on reporting and conduct of scoping reviews,⁴⁸ also used here.

Stage 1: identifying the research question

The Population, Concept, and Context (PCC) framework was used to define the review question. Elements of the PCC are described in detail in [table 1](#). This review intends to primarily answer the question: 'Which physical health conditions have been studied or observed to affect young care-experienced children in high-income countries?' If there are sufficient relevant primary studies which compare care-experienced children to control groups in the general, non-care population, then the review will also address the question: 'How do these health conditions affect children in care compared to their peers in the general population?'

Stage 2: identifying relevant studies

Keywords and synonyms to identify (1) care-experienced children; (2) health and wellbeing and (3) children aged greater than or equal to 3 months and less than 6 years will be combined to search the bibliographic databases. Studies of the health of care-experienced children previously known to the authors were used to identify keywords to form the basis of the search strategy for this review. Iterative pilot searches of MEDLINE were carried out to identify additional relevant keywords. This process ended when saturation was reached, and additional keywords/variants did not bring forth additional search results. Advice on keywords and search strategy was also taken from an Information Scientist within the University of Glasgow MRC/CSO Social and Public Health Sciences Unit. These keywords are detailed in an online supplemental file. The review will search for relevant studies indexed by the MEDLINE, CINAHL and Web of Science Core Collection (Science Citation Index (SCI-EXPANDED) and Social Sciences Citation Index (SSCI)). Search strategies are provided in the an online supplemental file 1. The search strategy will be adapted appropriately for the remaining databases. Following searches, all results will be imported to Rayyan and duplicates removed.⁴⁹

Stage 3: study selection

Search results will be screened for relevance to the Population, Concept, and Context described above. More specific inclusion and exclusion criteria are described below. Screening will be carried out using Rayyan.⁴⁹ Screening will take place in two stages: title and abstract screening then full texts. All titles and abstracts will be screened by DRRB and a minimum of 20% will be screened independently by a second reviewer. If it is unclear whether an article should be included based on the details in the title/abstract and there is potential for it to be relevant, then it will be progressed for full-text screening (e.g., if the study clearly includes care-experienced children, but the age of participants is not immediately apparent, it will be progressed to the full-text review stage). Non-English-language articles with

Table 1 Detailed description of the Population, Concept and Context used a foundation for the review research questions

Population	Care-experienced children who meet all following criteria: <ul style="list-style-type: none"> ▶ Aged greater than or equal to 3 months and less than 6 years ▶ Have experience of formal care settings listed in the introduction of this protocol, or similar settings ▶ Not adopted during the first 3 months of their life ▶ Not cared for in healthcare facilities, to avoid confounding
Concept	Physical health outcomes will be considered as those health conditions which are primarily rooted in or expressed through physiology. As a guide, these conditions will be those that are not listed in the International Classification of Diseases (11th Revision) ⁵³ diagnostic manual top-level entity on <i>Mental, behavioural or neurodevelopmental disorders</i> .
Context	Included studies will be restricted to those carried out in high-income countries. This is because children in care in low-income and middle-income countries face significantly different physical health issues. ^{45 46}

English-language abstracts that indicate relevance to this review will be translated and included. Crude inter-rater agreement will be reported along with Cohen's Kappa⁵⁰ and Scott's Pi.⁵¹ If crude agreement falls below 95% in this sample of 20% of titles/abstracts, then all items will be screened by at least two reviewers. During the next stage of screening, all full texts will be screened by DRRB and at least 20% will be screened by a second reviewer. Crude inter-rater agreement will be reported along with Cohen's Kappa and Scott's Pi. If crude agreement falls below 95%, then all full texts will be screened by at least two reviewers. Disagreements at any stage of screening will be resolved by discussion between the two reviewers. If consensus is not achieved, a third reviewer will make the final decision. Reasons for exclusion will be recorded and documented at each stage and reported in line as per the PRISMA-ScR guidelines.⁴⁸

Inclusion criteria

- ▶ Included studies will consider children currently living in family care with additional formal support from social or child protection services, kinship care, foster care, residential care, as well as children living with adopted families. Studies of children with previous experience of these settings will also be included, as will studies which aggregate groups of children either currently in or having previously been in care.
- ▶ Studies will be included if all children are aged greater than or equal to 3 months and less than 6 years, or if subgroup data for this group are reported.
- ▶ Study outcomes must include physical health conditions or diagnoses by a health professional, diagnostic manual, or validated measure(s). Studies which have made minor modifications to validated instruments may be included at reviewers' discretion. Studies which use parental report of a current or previous diagnosis by a clinician will be included.
- ▶ Studies will be included if they were carried out in high-income countries as defined by the World Bank.⁵²
- ▶ Only articles and reports published in peer-reviewed journals will be included.

Exclusion criteria

- ▶ Studies of children living in healthcare settings will be excluded to avoid confounding.
- ▶ Papers that look at only physiological markers will be excluded. For example, studies of expression of hormones, such as salivary cortisol, will be excluded unless explicitly linked to a health condition.
- ▶ Articles without an English language title and abstract.

Stage 4: charting the data

A bespoke data charting tool has been developed following identification of key variables from relevant studies identified during pilot searches (see the online supplemental file for details). The data to be extracted include information about the sample demographics (e.g., age and gender balance), type of care placement or

setting, health and developmental outcomes considered, study design, and country in which the study was carried out. Bibliographic information will also be included. Data extraction from included full-text articles will be carried out by one reviewer (DRRB) and at least 20% of these extractions will be verified independently by a second reviewer.

Stage 5: collating, summarising and reporting the results

The results of the search and screening process will be reported using a PRISMA-ScR flow diagram.⁴⁸ The details of included studies will be presented as tables. Aggregated descriptive statistics about studies will be presented. A thematic analysis will be carried out to identify emergent clusters of health conditions (if sufficient studies are identified). Differences in outcomes between children with and without care experience will be summarised if sufficient comparative studies are identified. Bibliographic information will be collated and presented including title, author(s), year of publication, and publishing journal.

ETHICS AND DISSEMINATION

This study will review publicly available knowledge, so requires no additional ethical approval. It is the intent of the authors to present the findings of this review as an article in a peer-reviewed journal and at relevant conferences. The results of this review will also inform future research into health conditions that may disproportionately affect care-experienced children, as well as potentially stimulating research into health conditions which have been under-researched in this group. This review also serves as a backdrop to a planned research project by the authors into the health and development of preschool children in care in Scotland. Additionally, the findings of this review will be of interest to practitioners and policy-makers working to understand and improve the health outcomes of care-experienced children. Our results will therefore also be circulated to interested stakeholders to make a direct and immediate contribution to the field.

Acknowledgements DRRB would like to thank Valerie Wells (Information Scientist, MRC/CSO Social & Public Health Sciences Unit) for advice about search strategies, and Avril Mason (Consultant Paediatric Endocrinologist, NHS Greater Glasgow and Clyde) for reviewing an initial draft of the manuscript.

Contributors DRRB conceptualised the scoping review and research questions, developed the search strategy and drafted the manuscript. DB, MA and ADMcM critically reviewed the review methods and provided comments on all aspects of initial draft of the manuscript. All authors have made substantial intellectual contributions to the work.

Funding This work was funded as by the Medical Research Council and the Scottish Government Chief Scientist Office as part of an MRC PhD studentship awarded to DRRB (MC_ST_00022). MA/DB were supported by the Economic and Social Research Council (grant number ES/T000120/1), the Medical Research Council (MC_UU_00022/2) and the Scottish Government Chief Scientist Office (SPHSU17).

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data sharing not applicable as no data sets generated and/or analysed for this study.

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REFERENCES

- Scottish Government. Children's Social Work Statistics, 2018-19. Edinburgh, 2020. Available: <http://www.gov.scot/Resource/0049/00499452.pdf>
- Department for Education. Children looked after in England including adoptions, 2021. Available: <https://explore-education-statistics.service.gov.uk/find-statistics/children-looked-after-in-england-including-adoptions>
- Högberg U, Sennerstam R, Wester K, et al. Medical diagnoses among infants at entry into out-of-home care: a Swedish population-register study. *Health Sci Rep* 2019;2:1-12.
- OECD Centre on Well-being, Inclusion S and EO (WISE). Measuring what matters for child well-being and policies. *OECD* 2021.
- Bronsard G, Alessandrini M, Fond G, et al. The prevalence of mental disorders among children and adolescents in the child welfare system: a systematic review and meta-analysis. *Medicine* 2016;95:e2622.
- McMahon AD, Elliott L, Macpherson LM, et al. Inequalities in the dental health needs and access to dental services among looked after children in Scotland: a population data linkage study. *Arch Dis Child* 2018;103:39-43.
- Murray ET, Lacey R, Maughan B, et al. Association of childhood out-of-home care status with all-cause mortality up to 42-years later: office of national statistics longitudinal study. *BMC Public Health* 2020;20:1-11.
- Murray ET, Lacey R, Maughan B, et al. Non-parental care in childhood and health up to 30 years later: ONS longitudinal study 1971-2011. *Eur J Public Health* 2020;30:1121-7.
- Sacker A, Lacey RE, Maughan B, et al. Out-of-home care in childhood and socio-economic functioning in adulthood: ONS longitudinal study 1971-2011. *Child Youth Serv Rev* 2022;132:106300.
- Engler AD, Sarpong KO, Van Horne BS, et al. A systematic review of mental health disorders of children in foster care. *Trauma Violence Abuse* 2022;23:255-64.
- McKenna S, Donnelly M, Onyeka IN, et al. Experience of child welfare services and long-term adult mental health outcomes: a scoping review. *Soc Psychiatry Psychiatr Epidemiol* 2021;56:1115-45.
- Vasileva M, Petermann F, Attachment PF. Attachment, development, and mental health in abused and neglected preschool children in foster care: a meta-analysis. *Trauma Violence Abuse* 2018;19:443-58.
- Goemans A, van Geel M, Vedder P. Over three decades of longitudinal research on the development of foster children: a meta-analysis. *Child Abuse Negl* 2015;42:121-34.
- Heady N, Watkins A, John A, et al. Prevalence of neurodevelopmental disorders and their impact on the health and social well-being among looked after children (lac): a systematic review protocol. *Syst Rev* 2022;11:49.
- Schneiderman JU, Leslie LK, Arnold-Clark JS, et al. Pediatric health assessments of young children in child welfare by placement type. *Child Abuse Negl* 2011;35:29-39.
- Kling S, Vinnerljung B, Hjert A. Somatic assessments of 120 Swedish children taken into care reveal large unmet health and dental care needs. *Acta Paediatr* 2016;105:416-20.
- Turney K, Wildeman C. Mental and physical health of children in foster care. *Pediatrics* 2016;138:e20161118.
- Nathanson D, Tzioumi D. Health needs of Australian children living in out-of-home care. *J Paediatr Child Health* 2007;43:695-9.
- Fleming M, McLay JS, Clark D, et al. Educational and health outcomes of schoolchildren in local authority care in Scotland: a retrospective record linkage study. *PLoS Med* 2021;18:e1003832.
- Martin A, Ford T, Goodman R, et al. Physical illness in looked-after children: a cross-sectional study. *Arch Dis Child* 2014;99:103-7.
- Verd S, Aguiló G, Kraemer M, et al. Past medical history: a comparison between children at the point of entry into the care system and children at home. *J Child Custody* 2018;15:228-40.
- Barsness KA, Cha E-S, Bensard DD, et al. The positive predictive value of rib fractures as an indicator of nonaccidental trauma in children. *J Trauma* 2003;54:1107-10.
- Gnanamanickam ES, Nguyen H, Armfield JM, et al. Hospitalizations among children involved in the child protection system: a long-term birth cohort study from infancy to adulthood using administrative data. *Child Abuse Negl* 2020;107:104518.
- İsıyel E, Tekşam Özlem, Foto-Özdemir D, et al. Home accident or physical abuse: evaluation of younger children presenting with trauma, burn and poisoning in the pediatric emergency department. *Turk J Pediatr* 2018;60:625-32.
- Fernandez E. Reasons for Children Entering Care. In: *Accomplishing Permanency: reunification pathways and outcomes for foster children*. Dordrecht: Springer Netherlands, 2013: 31-44.
- Cusworth L, Biehal N, Whincup H. Permanently progressing? children looked after away from home aged five and under in Scotland: experiences, pathways and outcomes, 2019. Available: <https://www.stir.ac.uk/media/stirling/services/research/documents/policy-briefings/Children-looked-after-away-from-home-aged-five-and-under-in-Scotland-experiences,-pathways-and-outcomes.pdf>
- Mc Grath-Lone L, Dearden L, Nasim B, et al. Changes in first entry to out-of-home care from 1992 to 2012 among children in England. *Child Abuse Negl* 2016;51:163-71.
- Naughton AM, Maguire SA, Mann MK, et al. Emotional, behavioral, and developmental features indicative of neglect or emotional abuse in preschool children: a systematic review. *JAMA Pediatr* 2013;167:769.
- Xu J, Zhu Y, Wang C, et al. The dental health of orphan and non-orphan children in fuyang city, China. *Oral Health Prev Dent* 2021;19:523-8.
- Simkiss DE, Stallard N, Thorogood M. A systematic literature review of the risk factors associated with children entering public care. *Child Care Health Dev* 2013;39:628-42.
- Reuben A, Moffitt TE, Caspi A, et al. Lest we forget: comparing retrospective and prospective assessments of adverse childhood experiences in the prediction of adult health. *J Child Psychol Psychiatry* 2016;57:1103-12.
- Bellis MA, Lowey H, Leckenby N, et al. Adverse childhood experiences: retrospective study to determine their impact on adult health behaviours and health outcomes in a UK population. *J Public Health* 2014;36:81-91.
- Gunton KB, Wasserman BN, DeBenedictis C. Strabismus. *Prim Care* 2015;42:393-407.
- Neil E, Gitsels L, Thoburn J. Children in care: where do children entering care at different ages end up? an analysis of local authority administrative data. *Child Youth Serv Rev* 2019;106:104472.
- Lionetti F, Pastore M, Barone L. Attachment in institutionalized children: a review and meta-analysis. *Child Abuse Negl* 2015;42:135-45.
- Oswald SH, Heil K, Goldbeck L. History of maltreatment and mental health problems in foster children: a review of the literature. *J Pediatr Psychol* 2010;35:462-72.
- Kemmis-Riggs J, Dickes A, McAloon J. Program components of psychosocial interventions in foster and kinship care: a systematic review. *Clin Child Fam Psychol Rev* 2018;21:13-40.
- Hickey L, Galvin K, Parolini A, et al. The engagement of children in out-of-home care with nursing and allied health professionals: a scoping review. *Child Care Health Dev* 2021;47:758-70.
- Hambrick EP, Oppenheim-Weller S, N'zi AM, et al. Mental health interventions for children in foster care: a systematic review. *Child Youth Serv Rev* 2016;70:65-77.
- Marcellus L, MacKinnon K, Gordon C, et al. Interventions and programs that support the health and development of infants with

- prenatal substance exposure in foster care: a scoping review. *JBMEvid Synth* 2021;19:1844–86.
- 41 Kang-Yi CD, Adams DR. Youth with behavioral health disorders aging out of foster care: a systematic review and implications for policy, research, and practice. *J Behav Health Serv Res* 2017;44:25–51.
 - 42 Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19–32.
 - 43 Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci* 2010;5:69.
 - 44 Grant MJ, Booth A. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Info Libr J* 2009;26:91–108.
 - 45 Moffa M, Cronk R, Fejfar D, et al. A systematic scoping review of hygiene behaviors and environmental health conditions in institutional care settings for orphaned and abandoned children. *Sci Total Environ* 2019;658:1161–74.
 - 46 Sewnet SS, Derseh HA, Desyibelew HD, et al. Undernutrition and associated factors among under-five orphan children in addis Ababa, Ethiopia, 2020: a cross-sectional study. *J Nutr Metab* 2021;2021:1–9.
 - 47 Peters M, Godfrey C, McInerney P. Chapter 11: Scoping Reviews. In: Aromataris E, Munn Z, eds. *JBME manual for evidence synthesis*. JBI, 2020.
 - 48 Tricco AC, Lillie E, Zarin W, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med* 2018;169:467–73.
 - 49 Ouzzani M, Hammady H, Fedorowicz Z, et al. Rayyan-a web and mobile APP for systematic reviews. *Syst Rev* 2016;5:210.
 - 50 Cohen J. A coefficient of agreement for nominal scales. *Educ Psychol Meas* 1960;20:37–46.
 - 51 Scott WA. Reliability of content analysis: the case of nominal scale coding. *Public Opin Q* 1955;19:321.
 - 52 World Bank. World bank country and lending groups. Available: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups> [Accessed 04 Apr 2022].
 - 53 World Health Organization. ICD-11: International classification of diseases (11th revision), 2019. Available: <https://icd.who.int/>

A. KEYWORDS

Care-experienced children

“care experienced child” OR cec OR “looked after child*” OR lac OR lacyp OR “out of home care” OR “foster* child*” OR “foster* care” OR “foster placement” OR “kinship care*” OR “substitute care” OR “kith and kin care” OR “friends and family care” OR “adopted child*” OR orphan* OR “residential care” OR “group home*” OR “child* home” OR “care home” OR “local authority care” OR “corporate parent” OR “child* protect*” OR “public care” OR “institution* care*” OR “supported living” OR “social care” OR “care placement” OR “child* welfare” OR “protective custody” OR “state custody”

Health

health OR healthcare OR medicat* OR condition* OR patholog* OR feeding OR growth OR thriv* OR stature OR stunting OR immuni* OR infect* OR symptom* OR disease* OR illness* OR “well-being” OR wellbeing OR neurodevelop* OR treatment* OR prescri* OR hospital*

Age

infan* OR pre-school OR preschool OR baby OR neonat* OR “under 6” OR “under six” OR “early intervention” OR birth OR “young child*” OR toddler

B. SEARCH STRATEGIES

MEDLINE via Ovid

Note: Lines beginning with “exp” instruct the database to explode the subject heading to include subsidiary terms.

- 1 exp Child, Foster/
- 2 exp Child, Adopted/
- 3 exp Foster Home Care/
- 4 (“care experienced child*” OR “looked after child*” OR lac OR “foster* child*” OR “adop* child*” OR orphan*).ab,ti.
- 5 (("out of home" OR foster* OR "friends and family" OR "kith and kin" OR kinship OR local authorit* OR institution* OR substitute) adj1 care).ab,ti.
- 6 ("care home" OR "group home" OR "child* home").ab,ti.
- 7 ("care placement" OR "foster placement").ab,ti.
- 8 ("corporate parent" OR "child* protect*" OR "public care" OR "protective custody" OR "child* welfare" OR "state custody" OR "supported accommodation" OR "supported living").ab,ti.
- 9 (infan* OR pre-school OR preschool OR baby OR babies OR neonat* OR "under 6" OR "under six" OR "early intervention" OR birth OR "young child*" OR toddler*).ab,ti.
- 10 exp Child, Preschool/
- 11 (health OR healthcare OR medicat* OR condition* OR patholog* OR feeding OR growth OR thriv* OR stature OR stunting OR immuni* OR infect* OR symptom* OR disease* OR illness* OR "well-being" OR wellbeing OR neurodevelop* OR treatment* OR prescri* OR hospital*).ab,ti.
- 12 exp Child Development/
- 13 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8
- 14 9 OR 10
- 15 11 OR 12
- 16 13 AND 14 AND 15

CINAHL via EBSCOHost

Note: Lines beginning with MH are subject headings/keywords. The “+” operator instructs the database to explode the subject heading to include subsidiary terms.

- S1 MH(Child, Abandoned OR Child, Adopted OR Child, Foster OR Child, Institutionalized OR Foster Home Care)
- S2 TX(care experienced child* OR looked after child* OR lac OR foster* child* OR adop* child* OR orphan*)
- S3 TX(("out of home" OR foster* OR "friends and family" OR "kith and kin" OR kinship OR local authorit* OR institution* OR substitute) N1 care)
- S4 TX("care home" OR "group home" OR "child* home")
- S5 TX("care placement" OR "foster placement")
- S6 TX("corporate parent" OR "child* protect*" OR "public care" OR "protective custody" OR "child* welfare" OR "state custody" OR "supported accommodation" OR "supported living")
- S7 MH("Infant+" OR Child, Preschool)
- S8 TX(infan* OR pre-school OR preschool OR baby OR babies OR neonat* OR "under 6" OR "under six" OR "early intervention" OR birth OR "young child*" OR toddler*)
- S9 MH(Child Health OR Dental Care for Children OR "Child Health Services+")
- S10 TX(health OR healthcare OR medicat* OR condition* OR patholog* OR feeding OR growth OR thrive* OR stature OR stunting OR immuni* OR infect* OR symptom* OR disease* OR illness* OR "well-being" OR wellbeing OR neurodevelop* OR treatment* OR prescri* OR hospital*)
- S11 S1 OR S2 OR S3 OR S4 OR S5 OR S6
- S12 S7 OR S8
- S13 S9 OR S10
- S14 S11 AND S12 AND S13

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- 1 TI=("care experienced child*" OR "looked after child*" OR lac OR "foster* child*" OR "adop* child*" OR orphan*) OR AB=("care experienced child*" OR "looked after child*" OR lac OR "foster* child*" OR "adop* child*" OR orphan*)
- 2 TI=((("out of home" OR foster* OR "friends and family" OR "kith and kin" OR kinship OR "local authorit*" OR institution* OR substitute) NEAR/1 care) OR AB=((("out of home" OR foster* OR "friends and family" OR "kith and kin" OR kinship OR "local authorit*" OR institution* OR substitute) NEAR/1 care)
- 3 TI=("care home" OR "group home" OR "child* home") OR AB=("care home" OR "group home" OR "child* home")
- 4 TI=("care placement" OR "foster placement") OR AB=("care placement" OR "foster placement")
- 5 TI=("corporate parent" OR "child* protect*" OR "public care" OR "protective custody" OR "child* welfare" OR "state custody" OR "supported accommodation" OR "supported living") OR AB=("corporate parent" OR "child* protect*" OR "public care" OR "protective custody" OR "child* welfare" OR "state custody" OR "supported accommodation" OR "supported living")
- 6 TI=(infan* OR pre-school OR preschool OR baby OR babies OR neonat* OR "under 6" OR "under six" OR "early intervention" OR birth OR "young child*" OR toddler*) OR AB=(infan* OR pre-school OR preschool OR baby OR babies OR neonat* OR "under 6" OR "under six" OR "early intervention" OR birth OR "young child*" OR toddler*)
- 7 TI=(health OR healthcare OR medicat* OR condition* OR patholog* OR feeding OR growth OR thriv* OR stature OR stunting OR immuni* OR infect* OR symptom* OR disease* OR illness* OR "well-being" OR wellbeing OR neurodevelop* OR treatment* OR prescri* OR hospital*) OR AB=(health OR healthcare OR medicat* OR condition* OR patholog* OR feeding OR growth OR thriv* OR stature OR stunting OR immuni* OR infect* OR symptom* OR disease* OR illness* OR "well-being" OR wellbeing OR neurodevelop* OR treatment* OR prescri* OR hospital*)
- 8 1 OR 2 OR 3 OR 4 OR 5
- 9 6 AND 7 AND 8

C. DATA CHARTING VARIABLES

Bibliographic variables

Article title, authors, year of publication, journal title.

Participant demographics and setting

Age (inc. measure of central tendency/dispersion), gender split, care placement type, country.

Study-related variables

Health outcomes studied, prevalence statistics/statistical methods used, effect sizes (where appropriate), study aims/objectives, study design, sample type(s), no. of care-experienced children in sample, no. of non-care children in control sample (where appropriate), key findings of relevance to review question.