

Eating behaviors in children in out of home care: a scoping review

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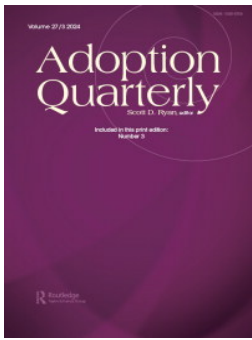
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Eating Behaviors in Children in out of Home Care: A Scoping Review

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ABSTRACT

Food shortages have been described as features of child neglect and consequential problematic eating behavior in children in out of home care has been reported in some countries. Other predictors of eating difficulties such as trauma and absence of routine are also high in this cohort. Research in this area is in its infancy and etiological understanding is limited. This scoping review sought to: (1) describe the patterns of eating behavior demonstrated by children in out of home care, (2) summarize the evidence base for any mechanisms behind these patterns and (3) synthesize existing information about appropriate interventions and lines of enquiry for these. Systematic searches were conducted, resulting in 16 studies eligible for inclusion. Patterns and inconsistencies are described; children in out of home care are particularly vulnerable to aberrant eating patterns and future lines of enquiry should consider mechanisms and potential intervention.

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Eating behavior; out of home care; foster care; kinship care; adoption

Introduction

For children residing in out of home care (foster, kinship, residential or adoptive homes), concerns around nutrition and dietary patterns can be a feature of their early adverse experiences. A shortage of food is universally considered to be an indicator of neglect in child welfare practice (Geiger & Schelbe, 2021) and in some cases, childhood obesity has also been a contributory factor to care admission (Viner et al., 2010). Regardless of food provision, children in out of home care typically experience early trauma which has been proposed to be associated with subsequent adverse eating behavior such as restrictive, emotional or disordered eating (Kent & Waller, 2000; Michopoulos et al., 2015). Children in care settings are also more likely to move between homes and primary carers, potentially undermining consistent habitual feeding practices which are known to support the development of healthy eating behaviors (Haines et al., 2019).

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Both over- and under- eating can lead to malnutrition (Saunders et al., 2011). Even without early adverse experiences being accounted for, globally children consume substantially fewer fruits and vegetables than national and international guidelines recommend (Cena & Calder, 2020; Vereijken et al., 2011) alongside over-consumption of ultra-processed foods (Gramza-Michałowska, 2020) and it is well established that the impact of such a poor diet can have negative outcomes. These include restrictive or over-eating (Rauber et al., 2015; Taylor & Emmett, 2019), poorer health outcomes (e.g. increased risk of diabetes or heart disease, Eyre et al., 2004) and increased risk of eating disorders, alongside other mental health problems (e.g. depression and anxiety) (Firth et al., 2020; Jebeile et al., 2021). There is a growing evidence base that indicates childhood food preferences can track into adulthood (Ventura & Worobey, 2013). This can include preference for high sugar/high salt, aversion to fruit and vegetables and general absence of variety. As such these challenges are likely to remain beyond adolescence. The purpose of this scoping review, therefore, is to explore the current literature base to establish whether there is evidence that children residing in out of home care are more likely to exhibit particular problematic eating behaviors than others and, if so, to consider whether there are fruitful lines of enquiry to pursue in terms of researching mechanisms and potential support systems for this cohort.

The term ‘problematic eating’ does not have an agreed definition in the literature. Parents have reported children’s problematic mealtime behaviors to include disruptive behavior, inability to stay at the table, attention seeking and food refusal (Anderson et al., 2012). Problematic eating can also refer to non-clinical disordered eating behaviors (Norrish et al., 2019). Reviews have investigated these types of behavior in many minoritized groups of children (e.g. neurodiversity, Nimbley et al., 2022, low-income, Hazzard et al., 2020 specific ethnic groups, Green, 2020). However, there is very little research indicating what patterns of eating behavior might look like in adoptive and foster care contexts (hereafter referred to as children in out of home care, OHC) and whether these patterns are more likely to be perceived as problematic or challenging than in other groups.

Theories of the etiology of aberrant, problematic and disordered eating behaviors in children vary but typically draw on a bio-psychosocial model, which emphasizes an interaction between biological vulnerabilities, psychological factors and psycho-social influences. For example, in children who are neurodivergent, differences in mealtime behaviors are sometimes attributed to sensory sensitivity (biological) and understanding of social expectations around eating (psycho-social) (Baraskewich et al., 2021). Explanations for picky eating in typically developing children, on

the other hand, have included physical problems with early feeding (biological), pressure to eat (social) and parental anxiety around food (psychological) (Taylor & Emmett, 2019). Broader developmental approaches to children's eating behaviors tend to focus on social learning, associative learning and repeated exposure as means to develop healthy eating behaviors (Ogden, 2010). Further to that, parents and carers are thought to be the principle agents of change to children's eating behaviors (Golan, 2006). It is plausible that problematic eating behaviors in children from OHC can also be explained by a bio-psychosocial model, but likely that the specific biological, psychological and social factors would be different to those seen in other cohorts, particularly because children in OHC are more likely to have experienced adverse experiences in early childhood (Tregeagle et al., 2019). This is important not only because of the potential physical and mental health implications, but also because appropriate treatment and support might differ if the etiology of these patterns is specific to this group.

Although the parameters of neglect are not always clear in social work practice or literature (Daniel et al., 2009), insufficient nutrition is a feature in its definition (Helton et al., 2018). In the UK, the definition includes 'inadequate provision of food' (Department for Education, 2018) and guidelines for professionals investigating child protection concerns advise that signs of abuse and neglect may include behaviors around food such as hoarding, hiding or stealing food (National Institute for Health and Care Excellence (NICE), 2008). With approximately 63% of children in out of home care having experienced abuse and neglect (NSPCC, 2021), it can be hypothesized that a substantial proportion of children living in out of home care may be vulnerable to challenges around food and eating. Indeed, evidence suggests that, despite some overlap, overall patterns of problematic eating in the OHC population might look a little different to other groups; there is particular focus in the literature on excessive eating (hyperphagia), restrictive eating, hoarding, stealing and storing food (not always with the intention to eat it), eating and drinking from contaminated sources, pica-like behaviors (consumption of non-food items), secret-eating, food neophobia (fear of new foods), preferences for unhealthy food and preoccupation with food (Norrish et al., 2019; Tarren-Sweeney, 2006). It stands to reason that children who are more likely to have come from attachment-insecure, neglectful or food insecure backgrounds might demonstrate more preoccupation with and propensity to hoard or steal food than other children, but there is little evidence to support the mechanisms behind these behaviors.

Research in this area remains in its infancy. In the absence of large-scale prevalence studies on the subject, it is important to collate the evidence available to try to form a 'bigger picture' outlook on the topic.

This is meaningful because it would allow for customized nutritional and behavioral support packages for children in OHC and their carers to nurture healthy eating habits as well as encouraging earlier preventative intervention in OHC. An example where tailored evidence-based feeding support has been designed and is now widely available due to well-documented literature is guidance for improving restricted diet in autistic children (e.g. National Autistic Society, 2020).

A lack of homogenous studies does not allow for a Systematic Review (Petticrew, 2006), and instead we have chosen to conduct a Scoping Review on the topic to allow for inclusion of as many studies as possible to synthesize as wide an evidence base as we can. Scoping reviews are designed to produce a ‘preliminary assessment of potential size and scope of available research...and to identify the nature and extent of research evidence’ (Grant & Booth, 2009). Nonetheless, the review followed conventional systematic search procedures. As such, the current review has the following aims:

1. To describe the patterns of eating behavior demonstrated by children in OHC.
2. To summarize the evidence base for any mechanisms behind these patterns.
3. To synthesize existing information about appropriate interventions and lines of enquiry for these.

Methods

This Scoping Review was prospectively registered on Open Science Framework on 5th January 2023 and final searches were run on 27th March 2024. Because of the inclusive nature of a Scoping Review (Petticrew, 2006), all papers relating to the eating behaviors of children in OHC (i.e. those in foster care, children who are adopted and children in any other form of out of home care) were considered eligible for inclusion in the review.

Search strategy

The search terms were created initially by co-authors pooling suggested terms, as well as identifying target papers that would be expected to emerge in searches. After practicing and establishing that some target papers were not appearing in the searches, terms were adjusted (in particular, the population terms were expanded to accommodate different terminology in different countries). A ‘not’ set of terms was also introduced to avoid repetitive erroneous results. The final set of terms are presented in [Table 1](#).

Table 1. Final search terms.

Population
adopted infant, adopted child, adopted adolscen*, adoptee*, adoption, adoptive, out-of-home care, out of home care, looked-after, looked after, local authority, foster care, kinship, residential care
AND
eating, meal*, food*, feed*
NOT
feedback, rat, animal, mouse

Databases searched were *PsychInfo* and *PubMed*. Further handsearching (including entering the search terms into *Google Scholar*¹ and searching the journals *Adoption Quarterly* and *Adoption & Fostering* because they are pertinent journals not indexed on PubMed or PsychInfo) was also conducted as well as backward and forward citation searching. Papers were searched at the abstract and title level, with filters applied such that full text, English language and human samples were included. No date restrictions were applied.

All results were screened by the project leader (SS) and double screened by one of two second coders (AS & JBM). Any disagreements were discussed and all were resolved. The Rayaan platform (Ouzzani et al., 2016) was used to store and organize search results.

Inclusion/exclusion criteria

Papers were included if participants were children (or parents/carers of) who currently reside in any form of OHC care and are under the age of 18. The rationale for excluding adults is two-fold: 1) the profile of ‘problematic eating’ is different between adults and children (e.g., Fox et al., 2018; Taylor et al., 2015), and 2) the focus of the scoping review is to ascertain whether there is potential further research for intervention in OHC settings so it is necessary to study these settings specifically (i.e. not adults living in other circumstances). Studies including participants over the age of 18 were included where at least some of the sample was under 18. At least one measure of children’s eating behavior should be included but there were no restrictions as to what these measures should be. All study designs were included if the above criteria were satisfied (i.e. neither interventions nor control groups were required for inclusion). Reviews were excluded to avoid bias and over-weighting of individual studies but were maintained for handsearching. Case studies were excluded due to the primary aim of seeking patterns of behavior. No date restrictions were applied due to the scoping nature of the review. Animal studies were excluded. Grey literature was included (i.e. dissertations, other documents uploaded to University repositories and pre-prints) due to the scarcity of studies on the topic and the need to be as inclusive as possible.

Data extraction and synthesis

A narrative synthesis was applied because we did not anticipate sufficiently homogenous studies to warrant meta-analysis (and this was indeed the case). For each paper, author, publication year, research questions, study design, main findings and measures used were extracted. No quality assessment tools were employed, as is typical in Scoping Reviews (Grant & Booth, 2009). Nonetheless, we were careful to consider the quality of each study included and to comment on this where appropriate in the narrative.

Results

Figure 1 shows the numbers of search results identified with the use of a PRISMA diagram (Page et al., 2021).

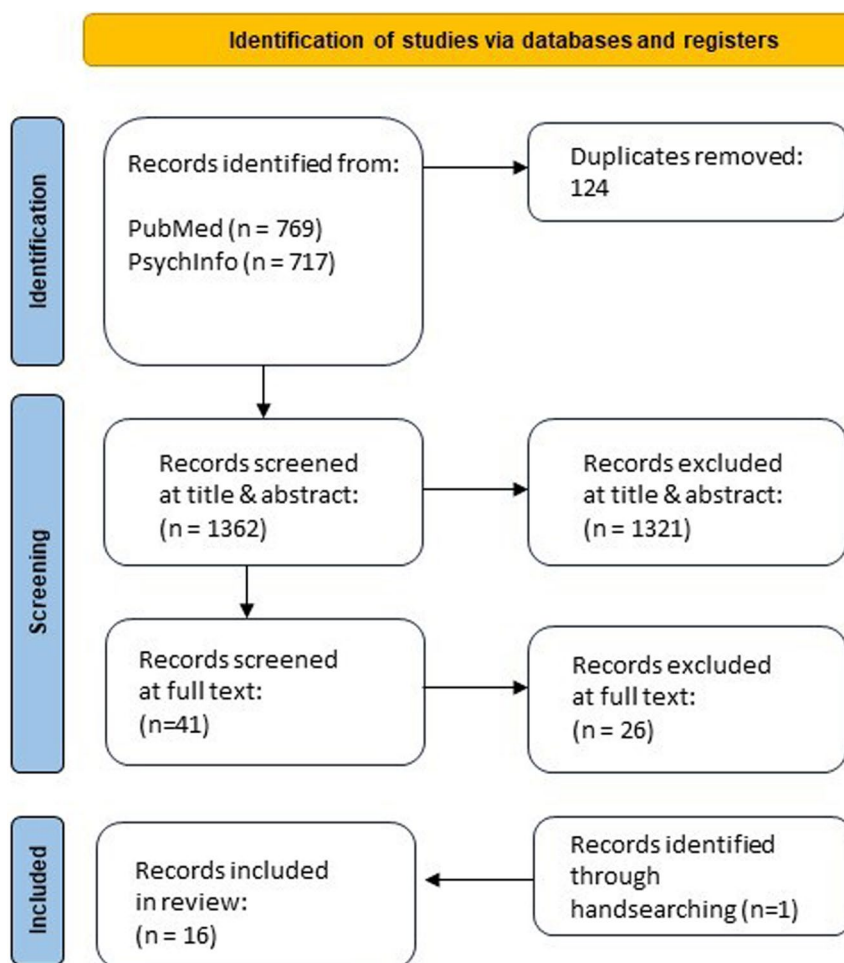


Figure 1. PRISMA diagram.

In total, five studies were conducted in Australia, three in the USA, three in the UK, two in New Zealand, one in Germany and one in Sweden. All papers were empirical studies (either aiming to quantitatively assess dietary or behavior patterns in children or qualitatively seeking to understand the experiences of carers and parents). There were also three papers describing the development of an intervention (the same intervention). The majority of samples included data for children from foster or kinship care and almost all data were provided by staff or carers (as opposed to children themselves) or were drawn from records (e.g. health records). The three exceptions to this had older (teenaged) samples (Holden, 1991; Kelly & Ogden, 2016; Rossman et al., 2020). Many papers did not distinguish between different care settings in their samples (see Table 2).

Table 2 presents a summary of the included studies.

Where statistically significant relationships or differences have been claimed in quantitative papers, appropriate p values and/or effect sizes are reported where available. Effect sizes are notably absent from the majority of papers.

Patterns of eating behavior demonstrated by children in OHC

Tarren-Sweeney (2006) studied a sample of 347 carers of pre-adolescent children in court-ordered foster or kinship care. They identified overeating (11 and 8% for boys and girls in the sample compared to 2 and 3% respectively in a normative sample) and Pica (3% and 2% compared to <0.5% for both genders in the normative sample). They also emphasized that excessive eating and hyperphagia do not always appear to lead to overweight. Tarren-Sweeney further identified in the 2013 paper in a sample of 230 young people living in long-term care, that prevalence ratings for eating too much (30%), gorging (23%), eating secretly (20%) and stealing food (15%) were apparently high (although there was no comparison group). Some of these patterns were supported by Parks (2012) whose sample of foster children aged between 8 and 20 years-old ($N=116$) comprised 38% participants overweight or obese and only 10% reached the recommended '5 a day' target, and by Norrish et al. (2019) who showed that carers from a sample of foster and residential carers ($N=44$) reported secret eating, hoarding, stealing food and gorging.

Kelly & Ogden (2016) compared a group of young people who had been in care ($n=32$) to a control group (comprised same-sex friend for each participant who had been in care, $n=32$) who had not. They found that picky eating and food disgust were both higher in the OHC group in addition to findings that 'meaning of food' differences were evident such that the control group were more likely to link food to sex, family life, treats and social interaction.



Table 2. Study details & main findings.

References	Date	Country of origin	Research Question/Objective	Sample characteristics (inc age where stated)	Main findings
Cox et al. (2015)	2015	Australia	To examine healthy lifestyle cognitions and behaviors of residential carers To describe resources needed to improve diet and/or physical activity outcomes for residents (Qualitative)	Residential care staff (N=243)	Majority of carers described appropriate knowledge of adolescent dietary, physical and sedentary activity (PA/SA) recommendations, encouraged healthy lifestyle habits and modeled appropriate PA and TV viewing. Around a third of carers did not score their unit highly on 'healthiness' and funding needs in Australian services were identified.
Cox et al. (2018)	2018	Australia	To explore experiences and opinions of key stakeholders regarding the HEAL intervention (Qualitative)	Carers (n=17) Programme coordinators (n=10)	Emphasized the need for interventions to address eating and physical activity habits of young people in out-of-home care. Identified low health literacy and competing priorities as possible mechanisms.
Ehrle & Geen (2002)	2002	USA	To compare kinship and non-kinship cared for children in terms of demographics and household structure. (Quantitative)	Carers of: Children in non-kin foster care (n=147) Children in kinship foster care (n=148) Children in voluntary kinship care (n=167) (Age: 0–17y)	Children in kinship care were more likely to face food insecurity than those in non-kin foster care (31–39% of those in kinship care compared to 13% in non-kin foster care lived in poverty). ($p < 0.05$)
Hadfield & Preece (2008)	2008	UK	To review the growth data of all children >5 years old from receipt into care to assess onset of obesity (in the year 2004). (Quantitative)	Data from: Children in the care of the local authority (N=106) (Age: 0–10+ y)	Looked-after children more likely to be overweight/obese than standard norms. 35% of sample increased BMI after being taken into care (statistics not reported, percentages provided)
Holden (1991)	1991	UK	To review family history of a series of adoptees with eating disorders. (Quantitative)	Eating disorder unit patients (adopted) n=18, non-adopted/control n=18	Clinical features of EDs in adopted cohort broadly similar to non-adopted. Possible evidence that substance abuse and para-suicidal behavior was higher in the adopted cohort, but small sample size. Differences in self-reported reasons for eating disturbance were also apparent between groups (p-values reported to be <0.05 but no further statistics reported)
Kelly & Ogden (2016)	2016	UK	To compare eating behavior of looked after young people and their non-looked after peers. (Quantitative)	Young people under care of local authority >12m when U16y (n=32) Young people never under care of local authority (cpntrol) (n=32) (Age: 16–25 y)	Picky eating and food disgust were higher in the looked after group (4.46 compared to 3.25 & 5.43 compared to 3.7, $p < 0.001$). Differences in 'meaning of food' were also found for sex (3.56 vs 4.13, $p = 0.04$), family life (3.8 compared to 5.06, $p < 0.001$), perceptions of treats (4.5 compared to 5.1, ($p = 0.02$) and social interaction (4.25 compared to 4.93, $p = 0.006$). Authors propose attachment difficulties as a prominent mechanism. ¹

(Continued)

Table 2. Continued.

References	Date	Country of origin	Research Question/Objective	Sample characteristics (inc age where stated)	Main findings
Markert et al. (2023)	2023	Germany	To describe individual food practices of adolescents in residential care (Quantitative)	400 adolescents living in German residential care Age: 12 – 21 yo	Two groups identified: <i>Independents</i> and <i>Embedded</i> . <i>Independents</i> ate fewer regular meals (1.83 compared to 2.73), and were more likely to eat alone (1.36 compared to 3.56) ² (unable to extract statistics for these specific relationships).
Norrish et al. (2019)	2019	Australia	Explore the rate of problematic eating among children in out of home care, investigate how carers manage problematic eating & understand carers' perceptions of the role of attachment & emotion in this context (Mixed Methods)	Residential carers (n = 36) Foster carers (n = 8) (Child age: 7 – 17y)	Carers reported high levels of items on the Food Maintenance Scale (e.g. secret eating 0.88, hoarding 0.95, stealing food 0.69, gorging 0.83) ³ . Qualitatively, this was supported and carers also reported children's preoccupation with food, nocturnal activities (including association with drug use) and historical food deprivation. Management strategies included modeling & adapting the environment. Difficulties included influence from biological parents & competing priorities (e.g. trying to foster secure attachment).
Parks (2012) (Note: this is the only unpublished work included in the review)	2012	USA	A series of PhD studies seeking to investigate the prevalence of eating difficulties among children in foster care, establish stakeholders' priorities for intervention design and describe current US guidelines in this context. (Mixed Methods)	Study 1: Foster children aged 8-17 (n = 116) Foster parents (n = 71) Study 2: Stakeholders (foster parents, researchers, social workers) (N = 38)	38% were overweight or obese & 10% reached 5-a-day target. Excessive sugary beverage intake was also noted. Obesity judged as most problematic eating behavior by stakeholders. Concluded interventions should target carers (rather than children)
Pizzirani et al. (2020)	2020	Australia	Protocol for delivery of an intervention, <i>HEALing Matters</i> . This builds on the <i>HEAL</i> intervention outlined in other papers (see Cox et al., above). (Narrative)	n/a	Outlines a system-level, organizational-level, residential home-level and individual-level approach to a planned intervention, designed to improve health literacy of residential care staff and young people.
Pizzirani et al. (2022)	2022	Australia	Description of the implementation of the <i>HEALing Matters</i> intervention. (Narrative)	n/a	Intervention ongoing and outcomes not presented. Authors conclude that there is a need for trauma-responsive health-focused interventions in out of home care.
Rossman et al. (2020)	2020	USA	Cross-sectional study comparing an adopted and a non-adopted sample for eating disorder symptomatology at three timepoints (over 4 years). (Quantitative)	Young people who were adopted (n = 561) and non-adopted (n = 20184). M age = 16.0 and 16.1 yo respectively at study start.	Some evidence of increased prevalence of eating disorder symptoms in the adoptive cohort, but not consistent across timepoints. Ps in the adopted cohort more likely ever to have been diagnosed with an eating disorder at time 3. (OR = 4.39, p < 0.001)

(Continued)

Table 2. Continued.

References	Date	Country of origin	Research Question/Objective	Sample characteristics (inc age where stated)	Main findings
Savaglio et al. (2021)	2021	Australia	Review to identify state of the literature regarding eating interventions in out-of-home-care, evaluation of similar general population interventions, and consideration of whether these could be implemented in out-of-home-care settings (Narrative)	n/a	Eating-related interventions for young people in out of home care could draw on existing general population interventions but should focus more on trauma-informed and attachment-focused perspectives
Strand et al. (2020)	2020	Sweden	To assess whether international adoptees have higher risk for EDs than native Swedes (Quantitative)	International adoptees (n = 25287) Native Swedes (n = 2046835)	Possible evidence for increased risk of EDs in the international adoptee group (HR for anorexia nervosa 1.27 in this group compared to non-adoptee group and for other EDs, 1.54).
Tarren-Sweeney (2006)	2006	New Zealand	To comprehensively survey aberrant eating in children from court-ordered foster and kinship care (Quantitative)	Carers of children residing in foster care (n = 297) And kinship care (n = 50) Age: 6 – 11 yo	Patterns of excessive eating, food acquisition & maintenance, and pica-type behaviors identified separately within the cohort ³ (9–10% in clinical range for FMS, 3–6% in clinical range for pica-type index)
Tarren-Sweeney (2013)	2013	New Zealand	Development of an adolescent-specific measure for young people in the care system		The Assessment Checklist for Adolescents was developed and tested. Of particular interest to this paper, this includes the Food Maintenance subscale ³

³In all cases on the Kelly and Ogden (2016) paper, values for looked after sample are reported before those of non-looked after sample. All measures were on a scale of 1–7. ²Markert et al. (2023) items measured on 5-point scale. ³See supplementary information for measure description for Food Maintenance Scale (FMS). A note on language: While we have ensured that language is consistent and sensitive throughout our narrative, we have taken care to use the same language as the authors in this summary table to avoid any change in meaning or interpretation.

Evidence around eating disorders (EDs) was less clear, but there was some evidence (Hadfield & Preece, 2008) to suggest that ED prevalence might be higher in children and young people in OHC than other groups. This is further supported by Savaglio et al. (2021) who propose that ED rates are higher in out-of-home care and note that Bulimia Nervosa might be particularly highly represented. Holden (1991), on the other hand, found that ED patterns were broadly similar in their adopted cohort than they were in a comparable non-adopted cohort. Rossman et al. (2020) also identified few differences in their sample of adopted and non-adopted young people when measuring ED symptoms, although members of the adopted group were more likely ever to have been diagnosed with an eating disorder at the end of their 4-year long study.

Further findings indicated that food insecurity is likely to be a problem that these groups face (e.g. Cox et al., 2016) and Ehrle & Geen (2002) also found that children in kinship care were less likely to be food secure than those in non-kinship care.

It is important to note that the heterogeneity of these studies extends to measurement methods as well as population types and variables measured. Future work that might seek to replicate or build on findings from the studies included in this review might benefit from employing comparable measures. See Supplementary information for a comprehensive list of measures related to eating, food and feeding used in the included studies.

Proposed mechanisms behind these patterns

It is important to try to understand mechanisms behind these particular patterns of problematic eating because they are likely to be different than those present in other groups (reflecting the fact the patterns themselves appear to be different).

A number of authors included in the review posit that trauma and/or insecure attachment provide likely explanations for some of the difficulties children in OHC face around food and eating (e.g. Kelly & Ogden, 2016; Norrish et al., 2019). This stands to reason; complex relationships between a carer and child may mean the child is less likely to trust their carer to meet their physical and emotional needs (Kelly & Ogden, 2016) and this could extend to their trust of the food with which they are provided. Furthermore, if a child has been neglected in the past, this may have involved withholding or even contamination of food by the parent (as outlined in Cox et al., 2016), further contributing to a distrust of the food provided. This explanation is further supported by the Norrish et al. (2019) study in which carers reported that, while they employed modeling and

environment adaptation strategies as ways to improve their children's dietary intake, they also faced competing priorities which meant that nutrition often was not the most important; in particular, they cited the need to foster secure attachment, emphasizing that if a child had challenging eating behaviors, it was often preferable to prioritize the relationship rather than add further tension by trying to encourage healthier eating habits.

Food insecurity has been proposed as another explanation for the eating behaviors of some children in OHC; in particular preoccupation with food, hoarding and stealing. Typically, this is described in the context of historical lack of food; if a child has grown to understand that they won't know where their next meal is coming from, it is logical that they might start to build supplies when the food becomes plentiful in a new environment. However, Ehrle & Geen (2002) also made the point that some children in care environments might experience a more contemporaneous lack of access to regular and healthy food; they noted that children in kinship care were more likely to face food insecurity than those in other care settings in their sample. As such, food insecurity might for some children act as a perpetuating factor rather than a predisposing one. These theories may also link to early exposure to unhealthy diet (Norrish et al., 2019).

Explanations less widely cited include developmental delays (Tarren-Sweeney, 2006) and, in older cohorts, increased risk of drug misuse which in turn may be linked to secret and nocturnal eating (Norrish et al., 2019). Developmental delays are known to be associated with a number of eating difficulties (e.g. Gal et al., 2011) and drug misuse has previously been associated with eating disorders (e.g. Corte & Stein, 2000), both in wider populations, so these explanations might be relevant to those specific members of OHC populations who experience these additional difficulties. As indicated above, it is also unclear whether children in OHC are at higher risk of EDs than others, but interestingly Holden (1991) found increased reporting of behavioral disturbance (e.g., drug misuse, theft) in their adopted cohort and postulated that mechanisms behind ED etiology may differ between groups, even if prevalence does not.

Two papers (Kelly & Ogden, 2016; Markert et al., 2023) explored the meaning of food in their samples, considering emotional significance of food and its meaning in terms of sex and family life. Samples and findings across these two studies were heterogenous with limited conclusions, but they indicate an area that warrants further investigation; if children and young people in OHC cohorts do perceive food and eating to represent different areas and meanings in life, this might also reflect different approaches to food and mealtimes. There may be some patterns emerging from the Kelly & Ogden (2016) paper

indicating that enjoyment of food is higher in the non-OHC samples; participants reported higher associations with food and sex, treats, family life and social interaction, all of which could plausibly be associated with enjoyment. Markert et al. (2023), on the other hand noted a sub-group of their OHC group who had less frequent meals and more meals alone, both of which indicate lower enjoyment of meals. Developing a profile of those vulnerable to lower enjoyment of food could be fruitful as it has been proposed as a protective factor against disordered eating, as indeed have several of the individual 'meanings' identified above (Langdon-Daly & Serpell, 2017).

Collectively, the authors have proposed several plausible mechanisms through which disturbed eating behaviors might develop in children in OHC. However, it must be recognized that the models and mechanisms proposed remain theoretical and untested. The explanations offered lend themselves to a bio-psychosocial model, in that all three elements are present in the combined narrative, but one that is somewhat different from those discussed earlier for other cohorts. A fruitful next step would be to draw on the existing evidence to conceptually consider mechanisms and to start to test these empirically, as opposed to relying on correlational data.

Nevertheless, it is likely that not all of these mechanisms apply to all problematic eating in the OHC population and, conversely, no single explanation is likely to account comprehensively for the patterns outlined.

Synthesis of existing information about appropriate interventions and lines of enquiry for these

Although three of the papers included in the review covered intervention development, these covered only two unique interventions which were developed by the same research group (Cox et al., 2018; Pizzirani et al., 2020; 2022). The first, *HEAL* (Healthy Eating Active Living) provided the basis for the second, *HEALing Matters*. To their credit, the authors designed the interventions with careful attention to theory and available literature as well as involving stakeholders and reporting reflections on the *HEAL* intervention which they were then able to build on to create the second. To date, this second intervention has not been reported in terms of evaluation, and instead these papers focus on the protocol and development. Nonetheless, this highlights the need for more work in the area. These interventions were based in Australia and care-systems vary substantially across cultures and countries (Palacios, 2019); therefore, a carefully developed intervention in one country will not necessarily translate well to another. Indeed, many of authors of the included papers were united

in their call for more intervention work in the areas of healthy eating and physical activity in care (e.g. Cox et al., 2016; Pizzirani et al., 2020; Savaglio et al., 2021; Parks, 2012), and in their emphasis on the need for trauma-informed approaches (e.g. Norrish et al., 2019; Pizzirani et al., 2022).

Two studies specifically enquired as to what support carers and parents would benefit from in this sense. While Cox et al. (2015) found that the majority of residential carers described appropriate knowledge of adolescent dietary recommendations, this might not translate to other carers (for example, kinship carers) and psychoeducation might be appropriate for some groups. Norrish et al. (2019), meanwhile, reported the competing needs carers face (e.g. fostering emotional bonds, substantial behavioral difficulties, managing relationships and input from biological parents) which meant not only that healthy eating and mealtime behaviors were compromised but sometimes that they directly conflicted with more important goals (e.g. providing healthier food might create mistrust for a neophobic child). Although few studies reported the number of moves children had experienced, this may also be relevant to the development of their approaches to food and eating; intervention development should also consider this in terms of etiology, feasibility and acceptability for carers.

Conclusions

This review has presented a synthesis of the existing evidence surrounding the eating behaviors of children in OHC, highlighting both a lack and heterogeneity of studies. Children in the OHC population are likely to have experienced abuse and neglect. Food neglect is considered to be grounds for state intervention (Rice et al., 2019; Viner et al., 2010) and the developmental impact of food neglect has been recognized both directly and indirectly (Helton et al., 2018) with adults who have experienced adverse childhood experiences more likely to be at risk of disordered eating (Yoon et al., 2022). Despite the prevalence of early adversity experienced by the majority of the OHC population, there is a paucity of data exploring the impact of this in the short or longer term.

Through assessing research across countries and methodological approaches, this scoping review has shown that some consistent behavioral patterns appear to be emerging in the literature. Most noticeably, children in OHC seem more likely than others to exhibit patterns of over-eating and hoarding, or conversely under-nutrition and food avoidance. A smaller sub-sample of these children also appear either to be concerned about contamination of food or actively to seek out consumption of contaminated

food or non-food items. Mechanisms for these behaviors remain unclear but trauma, insecure attachment and food insecurity/unavailability are commonly postulated explanations. There is a distinct absence of intervention work which likely reflects a broader lack of professional understanding in the field.

The ongoing problematic eating patterns in the OHC population discussed in this review demonstrate an urgent need for understanding and intervention in OHC to prevent longer term difficulties. Conducting large-scale qualitative and quantitative research with an aim to create a firmer and more nuanced picture of eating behavior in the OHC population is necessary. This data can then be utilized to begin to create appropriate and accessible support systems.

Note

1. While the authors recognize the benefits of *Google Scholar* (i.e. inclusion of grey literature, more comprehensive searching), it is also difficult to be truly systematic with its use (typically searches result in hundreds of thousands of results, and it is unclear how the order of results is decided, making it challenging to agree an appropriate cut-off and impossible to ensure replicability). As such, we used the database as part of our hand-searching procedure as opposed to treating it as a formal third search database in the PRISMA diagram.

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The authors report that there are no competing interests to declare.

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Data availability statement

This paper only drew on secondary data and as such no data has been stored in a repository. The authors are happy to share the search results and strategy in more detail than the paper describes on request.

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