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What Mental Health and Wellbeing Interventions Work for Which Children and Young People in Care? Systematic Review of Potential Outcome Inequities

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Abstract
Children and young people with care-experience (e.g. foster, kinship and residential care) report poorer mental health and wellbeing than the general population. Despite an emerging evidence-base for intervention, it is not clear if current approaches create, exacerbate or mitigate outcome inequities between different types of participants. We conducted a systematic review of international interventions targeting mental health, subjective wellbeing and suicide-related outcomes amongst care-experienced children and young people aged up to 25 years old. The review included a narrative synthesis of intervention inequities, exploring if they were more or less effective for different participant groups. Eight interventions, with 14 study reports, presented relevant data. Overall, there was no clear evidence that intervention participation could lead to inequitable impacts, being more or less effective for different groups. However, there was some tentative indication that individuals with lower exposure to maltreatment, fewer care placements, and increased baseline mental health problems, might be more responsive to intervention than other participants. There was limited evidence for wellbeing and no data availability for suicide. Future intervention evaluation should focus on assessing if there is potential to create, sustain or exacerbate inequities, and how approaches may be designed to mitigate this risk.

Keywords Foster care · Inequality · Mental health · Residential care · Systematic review

Background

Care-experienced children and young people are a diverse population, and can be defined as those who have lived in foster care, kinship care or residential care. They report poorer mental health and wellbeing when compared to non-care-experienced groups (Bronsard et al., 2016; Dubois-Comtois et al., 2021; Engler et al., 2022; Ford et al., 2018; Long et al., 2017), and are at a higher risk of suicide-related outcomes (Evans et al., 2017). While there remains limited comparative research, evidence suggests that mental health may be poorer for those in non-kinship placements as opposed to kinship care (Dubois-Comtois et al., 2021; Xu & Bright, 2018). Those who have unstable placements are more likely to experience adverse impacts on behavioural problems (Dubois-Comtois et al., 2021; Konijn et al., 2019). Meanwhile, increased exposure to cumulative maltreatment potentiates the risk of mental health symptomology (McGuire et al., 2018) and suicidality (Taussig et al., 2014).

There is an expanding range of interventions targeting the mental health and wellbeing of individuals in care, as synthesised in a number of systematic reviews (Barnett et al., 2019; Bergström et al., 2019; Everson-Hock et al., 2012; Greeson et al., 2020; Hambrick et al., 2016; Kerr & Cossar, 2014; Luke et al., 2014; Marsh, 2017; Solomon et al., 2017; Sullivan & Simonson, 2016). The evidence-base for

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different approaches is mixed, although a recent National Institute for Health and Care Excellence (NICE) review and associated guidelines recommended the need to facilitate positive relationships, training for carers in parenting knowledge and practice, and practitioner alignment with a trauma and attachment-based ethos (National Insitute for Health and Care Excellence, 2021; National Institute for Health & Care Excellence, 2021).

Despite the growing evidence-base from evaluation research, there are a number of limitations, notably a tendency to treat care-experienced populations as homogenous. Indeed, there is often limited consideration of the differential impact of different interventions for children and young people with diverse socio-demographic characteristics or care histories. This is important, as if some participants (based on individual or group characteristics) benefit more from an intervention than others, this can lead to outcome inequities. In some instances, these inequities can be created through intervention participation, as the outcome of interest does not differ between participant groups at baseline. In other cases, there may be an exacerbation of pre-existing inequities, with baseline differences in outcomes between participant groups being increased during the course of intervention engagement.

A lack of attention to intervention inequities has been an issue at both the individual evaluation and systematic review level. Outcome evaluations of mental health and wellbeing interventions rarely examine moderators, whereby pre-existing participant characteristics (e.g. baseline mental health problems) are reported to influence the amount of change observed during an intervention. This may be a result of small sample sizes and well documented challenges in recruiting to social care studies, meaning that studies do not have a sufficient number of participants to conduct such analyses (Mezey et al., 2015; Moody et al., 2021; Taussig et al., 2019). Equally, systematic reviews tend to undertake syntheses for discrete population groups and placement types (e.g. foster care) (Hambrick et al., 2016; Marsh, 2017; Turner & Macdonald, 2011).

Intervention evaluation research has increasingly encouraged a focus on the potential for inequities. Progression in intervention development and evaluation frameworks and methods has led to more emphasis on understanding the differential impacts of intervention across participant groups, with regular reference to the realist tenet of what works, for whom, and under what circumstances (Moore et al., 2021; Pawson et al., 1997; Skivington et al., 2021). Furthermore, there remains increased interest in unintended consequences (Oliver et al., 2019, 2020), and the risk of interventions actively causing harm for some participants and potentially worsening inequities.

Within systematic review methodology, acronyms such as PROGRESS-Plus (Place of residence; Race/ethnicity; Occupation; Gender/sex; Religion; Education; Socio-economic status; Social capital; Personal characteristics; features of relationships; and time-dependent relationships) have served as useful tools to support the identification of individual and group characteristics that might stratify outcomes and create, exacerbate or sustain health inequities (O'Neill et al., 2014). However, despite these advances, we are not aware of systematic reviews synthesising evidence on mental health and wellbeing interventions for care-experienced children and young people that have explicitly considered inequities in outcomes (Hambrick et al., 2016). This includes a lack of mapping to see the range of individual and group level characteristics currently being tested as moderators with the extant intervention evidence-base, and if interventions are causing or even amplifying inequities across these different types of participants.

CHIMES Systematic Review

The Care-experienced cHildren and young people's Interventions to improve Mental health and wEll-being outcomes Systematic review (CHIMES) was a complex-systems informed, mixed-methods review that synthesised international evidence on intervention theories, processes, outcomes, and economic effects (Evans et al., 2021, 2023). The review comprised three phases: construction of an evidence map charting key evidence gaps and clusters (Evans et al., 2023); method level syntheses for outcome evaluations (Rob et al., in press), process evaluations (MacDonald et al., 2024), and economic evaluations; and stakeholder consultation to reflect on the review synthesis and identify candidate interventions for development and/or adaptation, evaluation and implementation.

As part of the outcome synthesis, during phase two, we explored the potential for interventions to create, sustain or exacerbate inequities, by examining if there were differential impacts for different types of individuals as a result of their participation. Specifically, we considered the following questions:

1. What participant (individual and group) characteristics are included in the reporting of moderator analysis and interaction effects?
2. What, if any, inequities are observed as a result of different care-experienced groups participation in interventions?

To note, interventions included in this review did not have an explicit intention to mitigate inequities. As such, the review is not an assessment of whether interventions have failed in addressing their aims. Rather we offer an exploration of the potential for different types of interventions to lead to differential and arguably unfair impacts.

Method

The methodology of the CHIMES review is reported in the protocol (Evans et al., 2021) and the International Prospective Register of Systematic Reviews (PROSPERO) (CRD42020177478). We considered intervention inequities in relation to the Cochrane PROGRESS-Plus acronym (O'Neill et al., 2014). Details of the PROGRESS-Plus acronym is presented in Table 1.

Eligibility Criteria

We defined the parameters of the review in accordance with the Population, Intervention, Comparator, Outcome and Study Design (PICOS) framework. The target intervention population could be care-experienced children and young people (≤ 25 years old), or the individuals, organisations and communities that might impact them. We defined care as: foster care; formal kinship care; residential care; or other statutory transfer of parental responsibility to another adult. Interventions could be mono-component or multi-component and could operate across one or multiple socio-ecological domains (i.e. intrapersonal, interpersonal, organisational, community, and policy). We defined three primary outcome domains: subjective wellbeing (inclusive of life satisfaction, quality of life, and wellbeing); mental, behavioural or neurodevelopmental disorders as specified by the International Classification of Disease (ICD)-11; and suicide-related outcomes (inclusive of self-harm, suicidal ideation and suicide). Different study designs were eligible depending on the evidence type. For outcome evaluations, they had to be conducted with an RCT or non-randomised study design, which included controlled before-and-after studies and interrupted time series. For inclusion in the equity harm synthesis, eligible outcome evaluations had to include moderator analysis or interaction effects in their analysis of effectiveness, with data being reported on how participant characteristics structured intervention responsiveness across different types of individuals. Eligibility was limited to higher income countries.

Search Strategy and Study Retrieval

We developed a search strategy in Ovid MEDLINE, which we adapted to the functionality of each database. Study reports were identified from sixteen electronic bibliographic databases: Applied Social Sciences Index and Abstracts (ASSIA); British Education Index; Child Development & Adolescent Studies; CINAHL; Embase; Education Resources Information Center (ERIC); Cochrane Central Register of Controlled Trials; Cochrane Database of Systematic Reviews; Health Management Information Consortium (HMIC); International Bibliography of the Social Sciences; Medline; PsycINFO; Scopus; Social Policy & Practice; Sociological Abstracts; and Web of Science. We searched 22 relevant websites. Searches were undertaken from 1990 which marked the ratification of the United Nations Convention on the Rights of the Child (UNICEF, 1989), and an international expansion in children's social care provision. Searches were not restricted by language. Searches were conducted between May–June 2020, and updated between April–May 2022. We contacted 32 subject experts and 17 third sector organisations for recommendations. We screened relevant systematic reviews and undertook citation tracking with included study reports.

Data Management and Study Selection

We exported study reports to EndNote for de-duplication and then imported them to the Evidence for Policy and Practice Information and Co-ordinating (EPPI) Centre's review software EPPI Reviewer version 4.0 for management. One reviewer screened study titles for clearly irrelevant retrievals,

Table 1 PROGRESS-Plus Domains (O'Neill et al., 2014)

PROGRESS-Plus	Domains: Participant characteristics that might stratify intervention effects
P	Place of residence
R	Race/ethnicity/culture/language
O	Occupation
G	Gender/sex
R	Religion
E	Education
S	Socio-economic status
S	Social capital
Plus	1) Personal characteristics associated with discrimination (e.g. age, disability) 2) Features of relationships (e.g. relationship to primary care-giver) 3) Time-dependent relationships (e.g. transition from child to adult mental health services)

with irrelevant reports checked by a second. Two reviewers screened title and abstracts, and then full texts, independently and in duplicate. We used a screening proforma to conduct eligibility assessments, which was tested and calibrated with a subset of reports.

Data Extraction

We coded all study reports according to: country; publication date; intervention type; target population; intervention name; intervention characteristics; evidence type; study design; and intervention outcome domain. For outcome papers with relevant moderator analysis or interaction effects, we initially categorised participant characteristics according to the PROGRESS-Plus categories (see Table 1) (O'Neill et al., 2014). We then inductively coded sub-domains for these categories from study reports (e.g. maltreatment exposure was a sub-domain of features of relationships). In total we extracted: PROGRESS-Plus domain; characteristic sub-domain; analysis approach; overall intervention effects; and intervention effects by participant group. Two reviewers independently extracted and coded data for 10% of reports, discussing discrepancies. The remainder were extracted by one reviewer and checked by a second.

Intervention Inequities Synthesis

We produced a narrative overview and summary table of intervention inequities according to the three primary outcome domains: subjective wellbeing; mental, behavioural or neurodevelopmental disorders; and suicide-related outcomes. We constructed harvest plots where there were three or more study reports linked to discrete intervention evaluations reporting on a specific individual or group characteristic (e.g. maltreatment exposure) for an outcome domain.

Results

The overarching CHIMES review retrieved 64 interventions, with 124 linked study reports. In total, eight interventions, with 14 associated study reports, provided evidence related to intervention inequities (see Table 2). The process of study retrieval is reported in Fig. 1. Study reports were published between 2006 and 2021. The fourteen study reports were conducted in: USA (n = 12) (Akin, Becci et al., 2019; Chamberlain et al., 2008; DeGarmo et al., 2013; Dozier et al., 2006; Linares et al., 2006; Price et al., 2015; Smith Dana et al., 2011; Taussig et al., 2013, 2019; Weiler et al., 2021; Weiler & Taussig, 2019; Yan & De Luca, 2021); Canada (n = 1) (Marquis, 2014); and UK (n = 1) (Biehal et al., 2012).

Two interventions primarily targeted children and young people's knowledge and skills, in addition to their proximal relationships. Teach Your Children Well provides 30 weeks of individualised tutoring for children, supported by foster carers and researchers, with the aim of improving reading and mathematical competency (Marquis, 2014). Fostering Healthy Futures offers 30-weeks of group-based manualised curricula for children in out-of-home care, combined with individualised mentoring provided by graduate social work students (Taussig et al., 2013, 2019; Weiler & Taussig, 2019; Weiler et al., 2021).

Four interventions were largely parenting programmes targeting parenting knowledge, skill and confidence among biological parents, foster carers, kinship carers and residential carers. Attachment and Biobehavioural Catchup (ABC) is a 10-week manualised parenting programme with coaching sessions (Dozier et al., 2006). Parent Management Training Oregon (PMTO) is an in-home intervention delivered for up to six months, with practitioners meeting twice weekly with families to teach core skills (Akin Becci et al., 2019; Yan & De Luca, 2021). Incredible Years provides a trauma-informed group parenting programme to support positive parenting and engagement in the child welfare system (Linares et al., 2006). Pathways Home, which has a specific focus on supporting reunification, provides 32-weeks of parenting curricula and booster sessions to biological parents (DeGarmo et al., 2013).

Two interventions integrated parenting programmes into wider system resources, with supplementary system-level implementation strategies (e.g. train the trainer) to support delivery. Multidimensional Treatment Foster Care (MTFC), and the variation Multidimensional Treatment Foster Care for Adolescents (MTFC-A), provide specialist, supervised foster placements to young people, where there is specific expertise in positive behavioural management (Biehal et al., 2012; Chamberlain et al., 2008; Smith Dana et al., 2011). Meanwhile, Keeping foster parents trained and supported (KEEP), derived from MTFC, delivers parenting training for 'regular' foster and kinship carers (Price et al., 2015).

We present reviewer assessed inequities according to the three primary outcome domains of the review: subjective wellbeing; mental, behavioural and neurodevelopmental disorders; and suicide-related outcomes.

Subjective Wellbeing

Only one intervention, Fostering Healthy Futures, included evidence of potential inequities in relation to subjective wellbeing (Taussig et al., 2013, 2019; Weiler & Taussig, 2019; Weiler et al., 2021). There was mixed evidence for the interaction of maltreatment and quality of life. One study report indicated that the intervention had a stronger effect for children previously exposed to fewer Adverse Childhood Events (ACEs) (Taussig et al., 2019), which was a composite score of physical abuse, sexual abuse,

Table 2 Overview of Study Characteristics and Intervention Inequities

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
Attachment and Biobehavioural Catch-up USA	Dozier et al. (2006)	Gender: 50% male Age: 3.6–39.4 months Ethnicity: 63% African American, 32% White; 5% Biracial	Mental, behavioural and neurodevelopmental disorders: Total social, emotional and behavioural problems	3–6 months	Child: Age	Intervention effects greater for toddlers (18–36-month-old) compared to infants (0–17-month-old) ($F(1,42) = -4.75$, $p < .05$)
Fostering Healthy Futures USA	Taussig et al. (2013)	Gender: 49.3% male Average age: 9.92 years; Ethnicity: 45.8% Hispanic; 47.2% Caucasian; 29.9% African-American	Subjective Wellbeing: Quality of life	6 months	Child: Severity of neglect	Severity of neglect did not moderate intervention effect on quality of life
			Mental, behavioural and neurodevelopmental disorders: Total social, emotional and behavioural problems	6 months	Child: Severity of neglect	Severity of neglect did not moderate intervention effect on total social, emotional and behavioural problems
	Taussig et al. (2019)	Gender: 51.9% male Average age: 10.28 years Ethnicity: 50.6% Caucasian; 51.5% Hispanic; 28.4% African American	Subjective Wellbeing: Quality of life	6 months	Child: Gender	Gender did not moderate intervention effect on quality of life
				6 months	Child: Ethnicity	Ethnicity did not moderate intervention effect on quality of life
				6 months	Child: IQ	IQ did not moderate intervention effect on quality of life
				6 months	Child: Baseline mental health problems	Baseline mental health problems did not moderate intervention effect on quality of life
				6 months	Child: Adverse Childhood Events (ACEs)	Lower level of exposure to ACEs moderated intervention effect on quality of life ($\beta = 1.15$, $t = -2.06$; $p < .05$)

Table 2 (continued)

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
				6 months	Child: Placement type	Placement type (foster vs kin) did not moderate intervention effect on quality of life
			Mental health, behavioural and neurodevelopmental disorders: Total social, emotional and behavioural problems; stress and posttraumatic stress; dissociation	6 months	Child: Gender	Gender did not moderate intervention effect on mental health outcomes
				6 months	Child: Ethnicity	Ethnicity did not moderate intervention effect on mental health outcomes
				6 months	Child: IQ	IQ did not moderate intervention effect on mental health outcomes
				6 months	Child: Baseline mental health problems	Baseline mental health problems did not moderate intervention effect on mental health outcomes
				6 months	Child: Adverse Childhood Events (ACEs)	Intervention more effective for individuals with lower level of exposure to ACEs in reducing posttraumatic stress symptoms ($\beta = .15$; $t = 2.23$; $p < .05$). There was no interaction effect for total mental social, emotional and behavioural problems or dissociation
				6 months	Child: Placement type	Placement type (foster vs kin) did not moderate intervention effect on mental health outcomes

Table 2 (continued)

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
	Weiler and Taussig (2019)	Gender: 49.3% male Average age: 10.38 years Ethnicity: 45.8% Hispanic; 47.2% Caucasian; 29.9% African-American; 7.6% Native American; 1.4%; Asian American 1.4%; Pacific Islander 1.4%; 1.4% Other	Subjective wellbeing: Quality of life	6 months	Child: Adverse Childhood Events (ACEs)	Exposure to ACEs did not moderate intervention effect on quality of life (β = -.10, p = .38)
			Mental health, behavioural and neurodevelopmental disorders: Total social, emotional and behavioural problems; stress and posttraumatic stress; dissociation	6 months	Child: Adverse Childhood Events (ACEs)	Level of exposure to ACEs moderated the effect of the intervention on posttraumatic stress (β = .38, p = .001) and dissociation (β = .30, p = .005), with lower baseline risk predicting fewer symptoms. Exposure to ACEs did not moderate the intervention effect on total social, emotional and behavioural problems (β = .167, p = .14)
	Weiler et al. (2021)	Gender: 51.9% male Average age: 10.28 years Ethnicity: 50.6% White; 51.5% Hispanic; 28.4% African American; 7.6% Native American; 1.4.% Asian American; 1.4% Pacific Islander; 0.7% Other (non-exclusive categories)	Subjective wellbeing: Quality of life	6 months	Child: Placement stability	Intervention effect stronger for children with three or fewer caregiver transitions at baseline for quality of life (β = 0.031, p < .05)
				6 months	Child: Relationship with birth parents	Intervention effect stronger for children with poorer quality relationship with birth parents for quality of life ($\Delta\chi$ 2 (1) = 147.3, p < .05)

Table 2 (continued)

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
				6 months	Child: Relationship with foster carers	Intervention effect not moderated by quality of relationship with foster carers for quality of life ($\Delta\chi$ 2 (1) = 0.30, p > .05)
			Mental health, neurodevelopmental and behavioural disorders: Total social, emotional and behavioural problems; stress and posttraumatic stress; dissociation	6 months	Child: Placement stability	Intervention effect stronger for children with three or fewer caregiver transitions at baseline for dissociation (β = 0.831, p < .05) and posttraumatic stress (β = 0.842, p < .05). There was no differential impact on total social, emotional and behavioural problems (β = 0.065, p = .168)
				6 months	Child: Relationship with birth parents	Intervention effect not moderated by quality of relationships with birth parents for total social, emotional and behavioural problems ($\Delta\chi$ 2 (1) = 0.01, p > .05), posttraumatic stress ($\Delta\chi$ 2 (1) = 0.12, p > .05), and dissociation ($\Delta\chi$ 2 (1) = 0.05, p > .05)
				6 months	Child: Relationship with foster carers	Intervention effect not moderated by quality of relationships with foster carers for total social, emotional and behavioural problems ($\Delta\chi$ 2 (1) = 0.55, p > .05), posttraumatic stress ($\Delta\chi$ 2 (1) = 0.60, p > .05), and dissociation ($\Delta\chi$ 2 (1) = 0.05, p > .05)

Table 2 (continued)

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
Incredible Years USA	Linares et al. (2006)	Average age:6.2 years Placement type: 50% biological; 50% foster	Mental, behavioural and neurodevelopmental disorders: Externalizing problems	3 months post intervention; 6 months post baseline	Child: Baseline mental health problems	Baseline level of child conduct problems (low vs high) did not moderate intervention effect on externalizing problems
Keeping foster parents trained and supported (KEEP)	Price et al. (2015)	Intervention group Gender: 53% male Average age: 7.84 Ethnicity: 46% Hispanic; 23% African-American, 11% Caucasian; 2% Asian/Pacific Islander; 1% Native American; 16% Other Placement type: 70% kin; 30% non-kin	Mental, behavioural and neurodevelopmental disorders: Total social, emotional and behavioural problems	3–6 months	Child: Age	No interaction effect for child's age and total social, emotional and behavioural problems ($p > 0.05$)
					Child: Ethnicity	No interaction effect for child's ethnicity and total social, emotional and behavioural problems ($p > 0.05$)
					Child: Language group	No interaction effect for child's language group and total social, emotional and behavioural problems ($p > 0.05$)
					Child: Relationship to caregiver	No interaction effect for relationship to caregiver (i.e. kin vs. nonkin) and total social, emotional and behavioural problems ($p > 0.05$)
					Carer: Ethnicity	No interaction effect for caregiver ethnicity and total social, emotional and behavioural problems ($p > 0.05$)

Table 2 (continued)

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
					Carer: Months as a foster carer	No interaction effect for months as a carer and total social, emotional and behavioural problems ($p > 0.05$)
Multi-dimensional Treatment Foster Care (MTFC); Multi-dimensional Treatment Foster Care for Adolescents (MTFC-A) USA; UK	Biehal et al. (2012)	Gender: 54% male Average age:13.06 years Ethnicity: 88% White; 2% Black; 1% Asian; 9% Mixed; Placement type: 41% foster; 46% residential; 4% kin; 4% secure unit; 2% other	Mental, behavioural and neurodevelopmental disorders: Total social and emotional functioning	12 months	Child: Baseline mental health problems	More severe baseline mental health problems associated with improved total social and emotional functioning as measured by the Child Global Assessment Score (CGAS) ($p = 0.003$) but not by the Health of the Nation Outcome Scales for Children and Adolescents (HoNOSCA) ($p = 0.191$)
	Chamberlain et al. (2008)	Intervention group Gender: 50% male Average age: 8.88 years Ethnicity: 35% Latino; 23% African American; 23% Asian American; 20% Caucasian; 20% Mixed Ethnic; 23% Asian American; 1% Asian and Pacific Islander; 1% Native American; Placement type: 32% kin; 68% non-kin	Mental, behavioural and neurodevelopmental disorders: Total social, emotional and behavioural problems	5 months	Child: Baseline mental health problems	Intervention more effective for higher risk groups compared to lower risk groups, where high risk defined as six or more problem behaviours per day ($\Delta\chi$ 2 (3) = 19.12, $p < .001$)
	Smith Dana et al., (2011)	Gender: 100% female Average age: 11.54 years Ethnicity: 63% European American; 9% African American; 4% Native American; 10% Latino; 14% Multiracial	Mental, behavioural and neurodevelopmental disorders: Externalizing problem behaviours; internalising problem behaviours	6 months	Child: Age	No interaction effect for child age and externalizing and internalizing behaviours

Table 2 (continued)

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
				6 months	Child: Pubertal development	No interaction effect for child pubertal development and externalizing and internalizing behaviours
				6 months	Child: Baseline mental health problems	No interaction effect for baseline mental health problems and externalizing and internalizing behaviours
				6 months	Child: Maltreatment history	No interaction effect for exposure to maltreatment and externalizing and internalizing behaviours
Parent Management Training Oregon (PMTO) USA	Akin Becci et al., (2019)	Age: 3–16 years	Mental, behavioural and neurodevelopmental disorders: Total social, emotional and behavioural problems; total social and emotional functioning	6 months; 12 months	Child: Ethnicity	Being white (Wald χ^2 = -2.10, p = .036) and non-Latino (Wald χ^2 = 2.36, p = .018) associated with a reduction in total social, emotional and behavioural problems. Covariates not significantly moderated by the intervention condition
					Child: Baseline mental health problems	Higher baseline social and emotional functioning associated with improved social and emotional functioning (Wald χ^2 = 1.95, p = .051). Fewer baseline mental health problems associated with reduction in total social, emotional and behavioural problems (Wald χ^2 = 7.24, p < .001). Covariate not significantly moderated by the intervention condition

Table 2 (continued)

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
					Child: Rates of placement	Lower placement rate associated with improvement in social and emotional functioning (Wald $\chi^2 = 2.41$, $p = .016$) and reduction in total social, emotional and behavioural problems (Wald $\chi^2 = 2.50$, $p = .012$). Covariate not significantly moderated by the intervention condition
					Child: Number of prior removals	Prior foster care removal moderated intervention effect, with young people with prior foster care removals being less likely to reduce their total social, emotional and behavioural problems (Wald $\chi^2 = 2.340$, $p = .019$)
					Carer: Age	Having younger caregivers associated with improved social and emotional functioning (Wald $\chi^2 = 2.811$, $p = .005$). Having older caregivers associated with improved reduction in total social, emotional and behavioural problems (Wald $\chi^2 = 2.407$, $p = .016$). Covariate not significantly moderated by the intervention condition

Table 2 (continued)

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
	Yan and De Luca (2021	Gender: 53.5% male Average age: 11.8 years Ethnicity: 77.2% White;12.3% Latino	Mental, behavioural and neurodevelopmental disorders: Total social, emotional and behavioural problems; total social and emotional functioning	6 months	Carer: Carer functioning and child social and behavioural problems	Participants with poor parental functioning and child problem behaviours more likely than control counterparts to stay in class of poor parent functioning with child problem behaviours (OR = 4.41, p = 0.01). Participants with high parental functioning with medium child social-emotional issues more likely to move to a higher functioning class (OR = 0.22, p = 0.01)
Pathways Home USA	DeGarmo et al. (2013)	Gender: 50% male Average age: 8.28 years	Mental, behavioural and neurodevelopmental disorders: Total social, emotional and behavioural problems	4 months	Child: Age	No interaction effect for child age and total social, emotional and behavioural problems
					Child: Gender	No interaction effect for child gender and total social, emotional and behavioural problems
					Child: Risk Index (mother or father has been arrested, has a history of drug abuse, mental illness, poverty, etc.)	No interaction effect for child risk index and total social, emotional and behavioural problems
					Child: Placement transition rate	No interaction effect for child placement transition rate and total social, emotional and behavioural problems
					Child: Total number of parent and residential transitions	No interaction effect for total transitions and total social, emotional and behavioural problems

Table 2 (continued)

Intervention	Study Report	Population	Outcome Domain	Time to Follow-up	Socio-demographic characteristics	Summary of stratification of outcomes by socio-demographic characteristic
					Carer: Single parent	No interaction effect for parent relationship status and total social, emotional and behavioural problems
					Carer: Mothers drug and alcohol cravings	Intervention more beneficial for mothers with higher drug and alcohol craving relative to mothers with low drug and alcohol cravings on total social, emotional and behavioural problems ($\gamma = -.01$, $p = .001$)
Registered Education Savings Plan (RESP) for children in care Canada	Marquis (2014)	Intervention group Gender: 50% male Average age: 10.7 years	Mental, behavioural and neurodevelopmental disorders: ADHD; externalizing problem behaviours; internalizing problem behaviours	9 months	Child: Gender	No between group difference for boys and girls for intervention effects on ADHD, externalizing problem behaviours, or internalizing problem behaviours

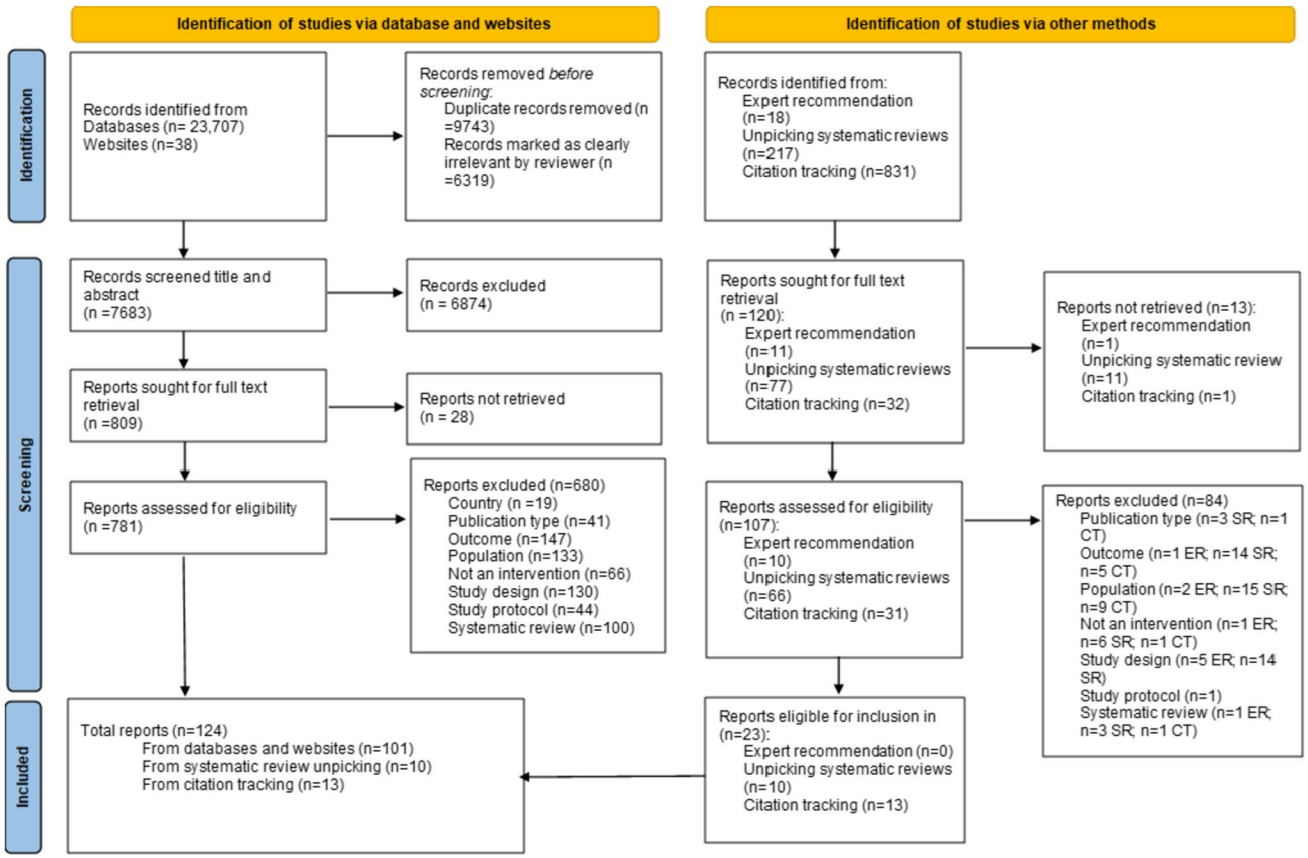

Fig. 1 CHIMES PRIMSA Flow Diagram

removal from a single parent household, exposure to community violence, caregiver transitions and school transitions. However, this was not supported in other analyses (Taussig et al., 2013; Weiler & Taussig, 2019).

There was some signal that the intervention was more effective for children with poorer relationship quality with birth parents and for those with fewer caregivers (Weiler et al., 2021), although this was only reported in one analysis. Generally, there was no differential effects for reported socio-demographic and care placement characteristics, including: children and young people's gender; ethnicity; IQ (Intelligence Quotient); baseline mental health problems; quality of relationship with foster carers; and placement type (foster care vs. kinship care) (Taussig et al., 2019; Weiler et al., 2021).

Mental, Behavioural and Neurodevelopmental Disorders

Eight interventions, with 14 study reports, provided data relevant to mental, behavioural and neurodevelopmental disorders.

Child and Young Person Characteristics

There was limited evidence of differential effects according to children and young people's: age (see Fig. 2) (DeGarmo et al., 2013; Dozier et al., 2006; Price et al., 2015; Smith Dana et al., 2011); gender (see Fig. 3) (DeGarmo et al., 2013; Marquis, 2014; Taussig et al., 2019); or ethnicity (see Fig. 4) (Akin Becci et al., 2019; Price et al., 2015; Taussig et al., 2019).

There was mixed evidence according to baseline mental health, exposure to maltreatment and placement characteristics. For child baseline mental health status (see Fig. 5), two evaluations of MTFC indicated increased responsiveness in higher risk groups with more problem behaviours prior to intervention commencement (Biehal et al., 2012; Chamberlain et al., 2008). However, for one of these evaluations, there was variance in the differential effects on social and emotional functioning depending on the outcome measurement tool used (Biehal et al., 2012). In contrast, four interventions reported that baseline mental health did not moderate: total social, emotional and behavioural problems or functioning (Akin Becci et al., 2019; Taussig et al., 2019); externalizing problems (Linares et al., 2006; Smith Dana et al., 2011); internalizing problems (Smith Dana et al.,

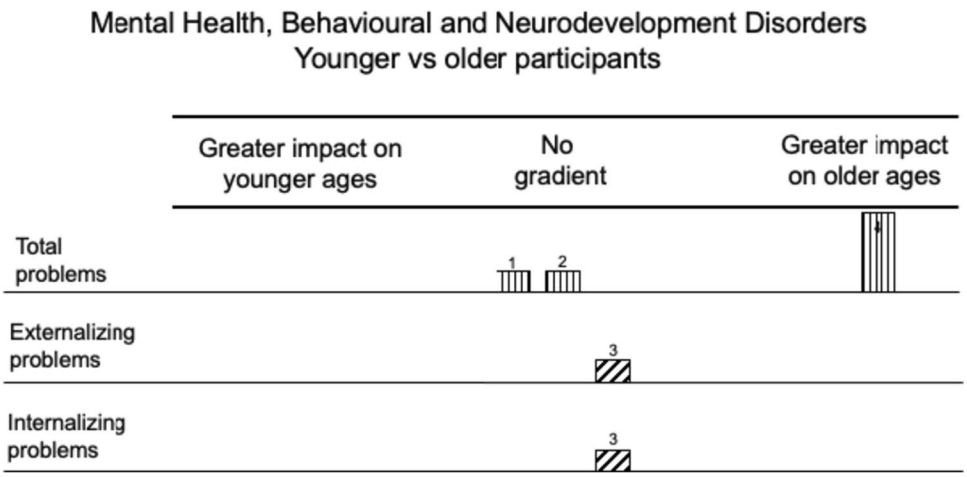

Fig. 2 Mental health, behavioural and neurodevelopmental disorders by children and young people's age. Notes: [1]Price et al. (2015) (1/4 bar); [2] DeGarmo et al. (2013) (1/4 bar); [3]Smith et al. (2011) (1/4 bar); [4]Dozier et al. (2006) (4/4 bar). [a] Height of bars represent the nature of the evidence presented by the trial: full height: significant moderation for a given outcome; three quarter height: pattern of moderation estimates including some significant moderation; half height: non-significant moderation trending in one direction; quarter height: only non-significance reported. [b] Shading of bars represent time to outcome at follow-up: vertical stripe: short-term outcomes of less than 6 months post-baseline; diagonal stripe: long-term outcomes of 6 months or more post-baseline

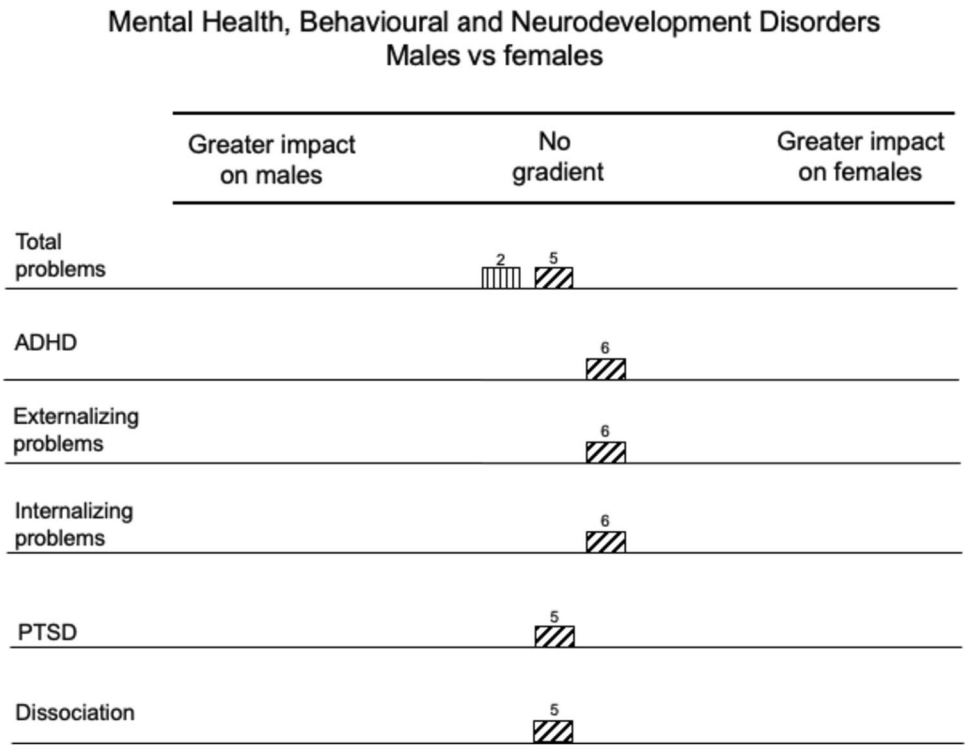

Fig. 3 Mental health behavioural and neurodevelopmental disorders by children and young people's gender**.** Notes: [2] DeGarmo et al. (2013) (1/4 bar); [5]Taussig et al. (2019) (1/4 bar); [6]Marquis (2014) (1/4 bar) [a] Height of bars represent the nature of the evidence presented by the trial: full height: significant moderation for a given outcome; three quarter height: pattern of moderation estimates including some significant moderation; half height: non-significant moderation trending in one direction; quarter height: only non-significance reported [b] Shading of bars represent time to outcome at follow-up: vertical stripe: short-term outcomes of less than 6 months post-baseline; diagonal stripe: long-term outcomes of 6 months or more post-baseline

2011); symptoms of PTSD (Taussig et al., 2019); or dissociation (Taussig et al., 2019).

For history of maltreatment and ACEs, evaluation of Fostering Healthy Futures reported an interaction effect (Weiler & Taussig, 2019), whereby children with fewer baseline ACEs reported fewer symptoms of stress and dissociation. A second analysis of the intervention's dataset provided support for this finding, showing a stronger treatment effect for PTSD among those with a lower number of ACEs (Taussig et al., 2019). However, analyses indicated there was no differential impact for total problem behaviours (Taussig et al., 2013, 2019; Weiler & Taussig, 2019) and one study showed no interaction for dissociation (Taussig et al., 2019). Meanwhile, evaluation of a version of MTFC, targeting girls

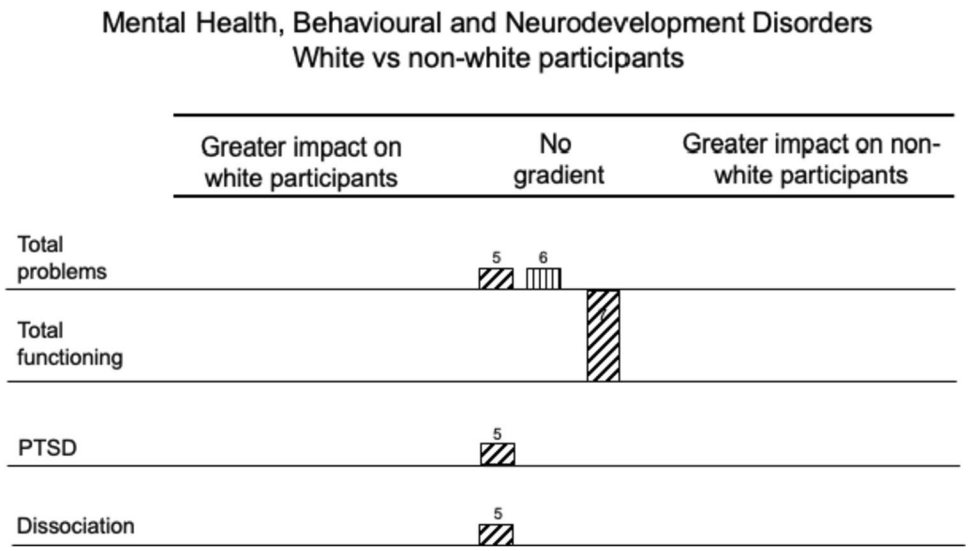

Fig. 4 Mental health behavioural and neurodevelopmental disorders by children and young people's ethnicity Notes: [5]Taussig et al. (2019) (1/4 bar); [6]Price et al. (2015) (1/4 bar); [7]Akin Becci et al. (2019) (4/4 bar) [a] Height of bars represent the nature of the evidence presented by the trial: full height: significant moderation for a given outcome; three quarter height: pattern of moderation estimates including some significant moderation; half height: non-significant moderation trending in one direction; quarter height: only non-significance reported [b] Shading of bars represent time to outcome at follow-up: vertical stripe: short-term outcomes of less than 6 months post-baseline; diagonal stripe: long-term outcomes of 6 months or more post-baseline

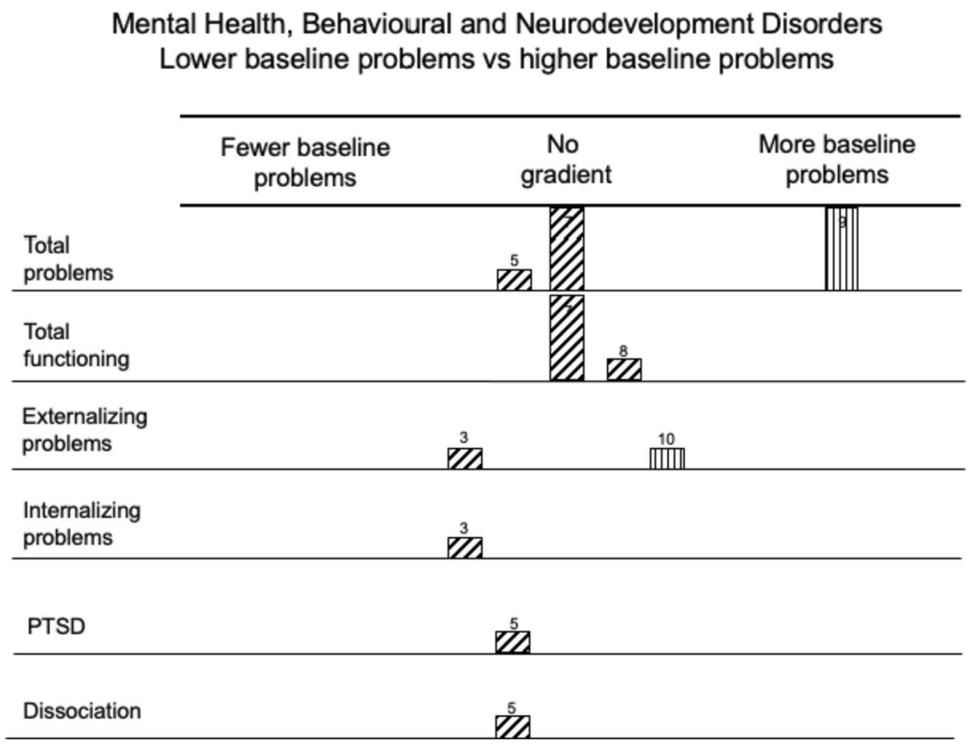

Fig. 5 Mental health behavioural and neurodevelopmental disorders by baseline mental health problems. Notes: [3]Smith Dana et al. (2011) (1/4 bar); [5]Taussig et al. (2019) (1/4 bar); [7]Akin Becci et al. (2019) (4/4 bar); [8]Biehal et al. (2012) (1/4 bar); [9]Chamberlain et al. (2008) (4/4 bar); [10]Linares et al. (2006) (1/4 bar) [a] Height of bars represent the nature of the evidence presented by the trial: full height: significant moderation for a given outcome; three quarter height: pattern of moderation estimates including some significant moderation; half height: non-significant moderation trending in one direction; quarter height: only non-significance reported [b] Shading of bars represent time to outcome at follow-up: vertical stripe: short-term outcomes of less than 6 months post-baseline; diagonal stripe: long-term outcomes of 6 months or more post-baseline

in foster care, found that pre-care exposure to sexual abuse and physical abuse did not predict a reduction in internalizing or externalizing problems post intervention (Smith Dana et al., 2011). Evaluation of the reunification intervention, Pathways Home, found that exposure to risk (e.g. mother or father has been arrested, has a history of drug abuse, mental illness, poverty, etc.) did not moderate total social, emotional and behavioural problems (DeGarmo et al., 2013).

In regard to placement type and change, Fostering Healthy Futures reported that the number of caregivers moderated the effectiveness for symptoms of PTSD and dissociation, with participants being more responsive where they had fewer caregiver transitions from birth to study baseline (Weiler et al., 2021). However, this differential impact was not seen for total problem behaviours. A further study reported that a young person with prior foster care placement removal was less likely to have a reduction in problem behaviours (Akin Becci et al., 2019). Additional studies reported no differential effects according to: placement transition rate (DeGarmo et al., 2013); total number of parent and residential transitions (DeGarmo et al., 2013); placement type (foster care vs kinship care) (Taussig et al., 2019); children's relationship to the care-giver (kin vs non-kin) (Price et al., 2015); and quality of relationship with birth parents and foster carers (Weiler et al., 2021).

Parent and Carer Characteristics

Study reports considered moderators and interaction effects in relation to parent and carer characteristics. PMTO reported that having younger caregivers was associated with improved social and emotional functioning and having older caregivers was associated with a reduction in mental health problems, but these were not significant moderators (Akin Becci et al., 2019). In a second evaluation of the intervention, the study suggested increased effectiveness where parents had a high level of baseline functioning and children had medium social-emotional skills (Yan & De Luca, 2021). Meanwhile, the KEEP intervention reported no differential effect according to carer ethnicity or number of months as a carer (Price et al., 2015). Evaluation of Pathways Home found that there was no differential effect according to parent relationship status (e.g. single). However, it was more effective in reducing total social, emotional and behavioural problems where birth mothers had a higher level of drug and alcohol cravings (DeGarmo et al., 2013).

Suicide-Related Outcomes

No intervention evaluations reported relevant data for suicide-related outcomes.

Discussion

The CHIMES systematic review synthesised extant international evidence for interventions targeting the mental health and wellbeing of care-experienced children and young people. As part of this, we mapped the individual and group participant characteristics that were considered as important moderators of intervention effectiveness, and which might impact the extent to which change would be observed. For the large part, moderators currently examined in the literature seem appropriate, as they reflect known variations in risk profiles for poor mental health in these populations, such as placement type (Dubois-Comtois et al., 2021; Xu & Bright, 2018), placement instability (Dubois-Comtois et al., 2021; Konijn et al., 2019) and maltreatment exposure (McGuire et al., 2018; Taussig et al., 2014). However, it should be noted, that the selection of moderating variables within evaluations were rarely justified and often did not have a clear theoretical rationale. This links to wider issues with interventions in this field, which tend to be under-theorised and poorly described (Evans et al., 2023).

We further conducted a synthesis of potential intervention inequities, drawing together moderator analysis and interaction effects from outcome evaluations. This was to understand possible differential impacts for participants with different characteristics, and if some individuals were relatively advantaged or disadvantaged by intervention engagement.

Overall, we identified limited evidence of intervention inequities. Indeed, of the 64 interventions eligible for the overarching review, only eight reported relevant analyses. There was a notable paucity of data available for interventions targeting subjective wellbeing, and none for interventions addressing suicide-related outcomes. This reflects a general lack of interventions in the wider CHIMES review targeting outcomes beyond mental, behavioural or neurodevelopmental disorders (Evans et al., 2023). As a caveat to this finding, we should note that we only included moderator and interaction effects to ensure the highest quality analyses, and if the review had extended to include a wider range of prescribed or exploratory subgroup analyses, we may have had a broader understanding of the evidence.

Where we identified relevant evidence, there was mixed evidence to suggest that certain socio-demographic characteristics might moderate intervention responsiveness and lead to inequities. There was some indication that interventions targeting both subjective wellbeing and mental health might have a stronger effect for those exposed to less severe maltreatment or adverse events (Taussig et al., 2019), although this finding was largely limited to

the Fostering Healthy Futures intervention, and was not consistent across all analyses from the evaluation. There was tentative evidence to indicate that interventions might work more effectively for young people who had more baseline mental health problems (Biehal et al., 2012; Chamberlain et al., 2008) and fewer placement transitions (Akin Becci et al., 2019; DeGarmo et al., 2013; Weiler et al., 2021).

However, despite individual intervention evaluations hinting that these factors might serve as potential moderators, they were accompanied by a number of other studies reporting no differential effects. As such, this finding should only be considered as a starting point in identifying moderators to be examined in more detail moving forward. Interestingly, some key potential moderators, such as placement type, which are regularly explored in the literature as being associated with mental health, did not feature as important causes of inequities. This might suggest that individuals with different placement types may have the same benefit (or lack of benefit) from the same intervention. This would also require further empirical exploration.

There should also be additional work to consider whether some of the characteristics included in the review that might stratify outcomes are conceptually appropriate and relevant. For example, age remains one of the key personal characteristics recommended by the PROGRESS-Plus framework (O'Neill et al., 2014). Within the review we identified that study reports tended to consider differential outcomes for younger and older children. For example, the evaluation of Attachment and Biobehavioural Catch-up found the intervention had greater effects for toddlers (18–36-month-old) compared to infants (0–17-month-old) (Dozier et al., 2006). Where interventions are delivered across the course of childhood and adolescence, it might not be helpful to consider issues of age in relation to inequities. Rather it might be an issue of interventions needing to be delivered at an appropriate developmental stage.

In the identification of moderators, it is important to acknowledge that not all of them are inherently problematic. As indicated in the expansive literature on 'intervention-generated inequities', inequities tend to occur when interventions are of most benefit to the most privileged (Lorenc & Oliver, 2014; Oliver et al., 2019; Veinot et al., 2018). They arguably mitigate inequities when they are more beneficial to the most disadvantaged. However, this is complicated by populations where all individuals may be considered to be structurally 'vulnerable', or 'high risk', as it can be difficult to conceptualise who constitutes the 'privileged' group. For example, some might suggest that young people with more baseline mental health problems are at a greater disadvantage. As such interventions that benefit these individuals the most serves to reduce equities. But such assumptions are not completely evident and need more theoretical enquiry and empirical examination.

Reflecting on the general lack of moderator analysis or interaction effects reported in the evidence-base, there are measures that need to addressed in order to strengthen the evidence-base moving forward. This includes addressing a number of widely reported methodological and practical challenges in social care research. Small sample sizes and lack of statistical power have been cited as a key barrier to testing moderators for this population (Hambrick et al., 2016; Taussig et al., 2019). There are also noted issues around study recruitment and retention (Mezey et al., 2015; Moody et al., 2021). As a result, there has been suggestion that evaluations need to prioritise achieving larger samples sizes moving forward (Hambrick et al., 2016), and to make use of improved conceptual models to guide the analysis (Sandler et al., 2014).

Implications for Policy, Practice and Future Research

The review has a number of key implications. Primarily, there is a need to clearly recognise that care-experienced children and young people are not a homogenous population, but have different risk profiles, care histories and intervention needs. As such, intervention development and adaptation processes need to ensure engagement with diverse stakeholders to ensure sensitivity to variations in the population and context (Moore et al., 2021; O'Cathain et al., 2019). In developing approaches, it should be noted that efforts to anticipate and mitigate inequities, often through the specific targeting of those who are disadvantaged, can lead to a range of adverse effects. This can include stigma and negative labelling (Lorenc & Oliver, 2014; Oliver et al., 2019; Veinot et al., 2018). As such, it is important to consider the relative risks and benefits of targeted and universal approaches, and foreground considerations of unintended harms in the developmental process. As indicated, evaluation research would benefit from increased sample sizes to allow for analysis of moderators, while also considering the role of process evaluations and qualitative evidence in understanding how and why intervention differentially impacts different care-experienced young people (Moore et al., 2015). In order to generate this data, further work will likely be needed to ensure meaningful engagement of these populations in research to support recruitment and retention. It would also be advantageous to have some standardisation in the reporting of, potentially in accordance with the PROGRESS-Plus framework, to support future evidence syntheses (O'Neill et al., 2014).

In regard to policy and practice, there should be increased focus on equality and equity impact assessments for policies related to health and social care provision for care-experienced individuals, both when they are a targeted population

or recipients of universal provision. Such assessments are increasingly mandatory for governmental departments (Department of Health and Social Care, 2023), and there has been specific interest in potential harms for both current and future generations (Azam, 2020; Welsh Government 2015). There is also scope to improve the interface of research, policy and practice, with an increasing range of online tools, frameworks and depositories of resources to enhance the readiness and relevance of research evidence in tackling health inequalities (For Equity, 2023).

Strengths and Limitations

The present systematic review is one of the first to consider intervention inequities in this area of study. However, there are a number of limitations that should be considered when interpreting the results. First, as indicated, we only included moderator and interaction terms within the review. As such, additional types of analysis that might have provided insights and perspectives in relation to intervention inequities were not integrated into the synthesis. Second, while we conducted quality appraisal of the outcome evaluations, we did not appraise study analyses in relation to equity. There were potential issues with included study reports, notably the limited reporting of data, with some evaluations simply indicating that moderators significantly impacted intervention responsiveness. Some evaluations also only reported data where moderators were significant. The size of the bars included in the harvest plots are intended to represent variation in the strength of analysis and reporting.

Conclusion

In the present systematic review, we synthesised evidence of potential inequities from moderator analysis or interaction effects reported in evaluations of interventions targeting the mental health and wellbeing of children and young people with experience of care. We might very tentatively suggest that participants' mental health is more responsive to change where there are increased baseline mental health problems, less maltreatment exposure, and fewer care placements and transitions. However, these moderators need more examination. There was also limited analyses for wellbeing and no data availability for suicide-related outcomes. Future intervention development might focus on working with diverse care-experienced young people to ensure their needs are met, while evaluations require larger sample sizes to allow for exploration of whether interventions create, sustain or exacerbate inequities.

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Declarations

Competing interests The authors declare that they have no competing interests.

Ethical Approval The CHIMES review was exempted from ethical approval from Cardiff University's School of Social Sciences Research Ethics Committee.

References

Akin Becci, A., Lang, K., McDonald Thomas, P., Yan, Y., & Little, T. (2019). Randomized trial of PMTO in foster care: Six-month child well-being outcomes. *Research on Social Work Practice, 29*(2), 206–222. https://doi.org/10.1177/1049731516669822

Azam, S. (2020). A 'futures' approach towards the wellbeing of future generations in Wales and beyond. *European Journal of Public Health*. https://doi.org/10.1093/eurpub/ckaa165.1289

Barnett, E. R., Concepcion-Zayas, M. T., Zisman-Ilani, Y., & Bellonci, C. (2019). Patient-centered psychiatric care for youth in foster care: A systematic and critical review. *Journal of Public Child Welfare, 13*(4), 462–489. https://doi.org/10.1080/15548732.2018.1512933

Bergström, M., Cederblad, M., Håkansson, K., Jonsson, A. K., Munthe, C., Vinnerljung, B., Wirtberg, I., Östlund, P., & Sundell, K. (2019). Interventions in foster family care: A systematic review. *Research on Social Work Practice, 30*(1), 3–18. https://doi.org/10.1177/1049731519832101

Biehal, N., Dixon, J., Parry, E., Sinclair, I., Green, J., Roberts, C., Kay, C., Kapadia, D., Rothwell, J., & Roby, A. (2012). *The care placements evaluation (CaPE) evaluation of multidimensional treatment foster care for adolescents (MTFC-A)*. Department for Education.

Bronsard, G., Alessandrini, M., Fond, G., Loundou, A., Auquier, P., Tordjman, S., & Boyer, L. (2016). The prevalence of mental disorders among children and adolescents in the child welfare system:

A systematic review and meta-analysis. *Medicine, 95*(7), e2622–e2622. https://doi.org/10.1097/MD.0000000000002622

Chamberlain, P., Price, J., Leve, L. D., Laurent, H., Landsverk, J. A., Reid, J. B., Chamberlain, P., Price, J., Leve Leslie, D., Laurent, H., Landsverk John, A., & Reid John, B. (2008). Prevention of behavior problems for children in foster care: Outcomes and mediation effects. *Prevention Science, 9*(1), 17–27. https://doi.org/10.1007/s11121-007-0080-7

DeGarmo, D. S., Reid, J. B., Fetrow Becky, A., Fisher Philip, A., & Antoine Karla, D. (2013). Preventing child behavior problems and substance use: The Pathways home foster care reunification intervention. *Journal of Child & Adolescent Substance Abuse, 22*(5), 388–406. https://doi.org/10.1080/1067828X.2013.788884

Department of Health and Social Care. (2023). Health and Care Act 2022: combined impact assessments. https://www.gov.uk/government/publications/health-and-care-act-2022-combined-impact-assessments

Dozier, M., Peloso, E., Lindhiem, O., Gordon, M. K., Manni, M., Sepulveda, S., Ackerman, J., Bernier, A., & Levine, S. (2006). Developing evidence-based interventions for foster children: An example of a randomized clinical trial with infants and toddlers. *Journal of Social Issues, 62*(4), 767–785. https://doi.org/10.1111/j.1540-4560.2006.00486.x

Dubois-Comtois, K., Bussières, E.-L., Cyr, C., St-Onge, J., Baudry, C., Milot, T., & Labbé, A.-P. (2021). Are children and adolescents in foster care at greater risk of mental health problems than their counterparts? A meta-analysis. *Children and Youth Services Review, 127*, 106100. https://doi.org/10.1016/j.childyouth.2021.106100

Engler, A. D., Sarpong, K. O., Van Horne, B. S., Greeley, C. S., & Keefe, R. J. (2022). A systematic review of mental health disorders of children in foster care. *Trauma, Violence, & Abuse, 23*(1), 255–264.

Evans, R., Boffey, M., MacDonald, S., Noyes, J., Melendez-Torres, G., Morgan, H. E., Trubey, R., Robling, M., Willis, S., & Wooders, C. (2021). Care-experienced cHildren and young people's Interventions to improve Mental health and wEll-being outcomes: Systematic review (CHIMES) protocol. *British Medical Journal Open, 11*(1), e042815.

Evans, R., MacDonald, S., Trubey, R., Noyes, J., Robling, M., Willis, S., Boffey, M., Wooders, C., Vinnicombe, S., & Melendez-Torres, G. (2023). Interventions targeting the mental health and wellbeing of care-experienced children and young people in higher-income countries: Evidence map and systematic review. *Systematic Reviews, 12*(1), 1–33.

Evans, R., White, J., Turley, R., Slater, T., Morgan, H., Strange, H., & Scourfield, J. (2017). Comparison of suicidal ideation, suicide attempt and suicide in children and young people in care and non-care populations: Systematic review and meta-analysis of prevalence. *Children and Youth Services Review, 82*, 122–129.

Everson-Hock, E. S., Jones, R., Guillaume, L., Clapton, J., Goyder, E., Chilcott, J., Payne, N., Duenas, A., Sheppard, L. M., & Swann, C. (2012). The effectiveness of training and support for carers and other professionals on the physical and emotional health and well-being of looked-after children and young people: A systematic review. *Child Care Health Development, 38*(2), 162–174. https://doi.org/10.1111/j.1365-2214.2011.01247.x

For Equity. (2023). *For equity: Focus on research and equity*. NIHR School for Public Health Research and NIHR Applied Research Collaboration North West Coast. https://forequity.uk/

Ford, T., Vostanis, P., Meltzer, H., & Goodman, R. (2018). Psychiatric disorder among British children looked after by local authorities: Comparison with children living in private households. *British Journal of Psychiatry, 190*(4), 319–325. https://doi.org/10.1192/bjp.bp.106.025023

Greeson, J. K. P., Garcia, A. R., Tan, F., Chacon, A., & Ortiz, A. J. (2020). Interventions for youth aging out of foster care: A state of the science review. *Children and Youth Services Review, 113*, 105005. https://doi.org/10.1016/j.childyouth.2020.105005

Hambrick, E. P., Oppenheim-Weller, S., N'zi, A. M., & Taussig, H. N. (2016). Mental health interventions for children in foster care: A systematic review. *Children and Youth Services Review, 70*, 65–77. https://doi.org/10.1016/j.childyouth.2016.09.002

Kerr, L., & Cossar, J. (2014). Attachment interventions with foster and adoptive parents: A systematic review. *Child Abuse Review, 23*(6), 426–439. https://doi.org/10.1002/car.2313

Konijn, C., Admiraal, S., Baart, J., van Rooij, F., Stams, G.-J., Colonnesi, C., Lindauer, R., & Assink, M. (2019). Foster care placement instability: A meta-analytic review. *Children and Youth Services Review, 96*, 483–499. https://doi.org/10.1016/j.childyouth.2018.12.002

Linares, L. O., Montalto, D., Li, M., & Oza, V. S. (2006). A promising parenting intervention in foster care. *Journal of Consulting and Clinical Psychology, 74*(1), 32–41. https://doi.org/10.1037/0022-006X.74.1.32

Long, S. J., Evans, R. E., Fletcher, A., Hewitt, G., Murphy, S., Young, H., & Moore, G. F. (2017). Comparison of substance use, subjective well-being and interpersonal relationships among young people in foster care and private households: a cross sectional analysis of the School Health Research Network survey in Wales. *BMJ Open*. https://doi.org/10.1136/bmjopen-2016-014198

Lorenc, T., & Oliver, K. (2014). Adverse effects of public health interventions: A conceptual framework. *Journal of Epidemiology and Community Health, 68*(3), 288–290. https://doi.org/10.1136/jech-2013-203118

Luke, N., Sinclair, I., Woolgar, M., & Sebba, J. (2014). *What works in preventing and treating poor mental health in looked after children*. NSPCC.

MacDonald, S., Trubey, R., Noyes, J., Vinnicombe, S., Morgan, H. E., & Willis, S. et al. (2024). Mental health and wellbeing interventions for care-experienced children and young people: Systematic review and synthesis of process evaluations. *Children and Youth Services Review, 156*, 107266. https://doi.org/10.1016/j.childyouth.2023.107266

Marquis, R. (2014). The gender effects of a foster parent-delivered tutoring program on foster children's academic skills and mental health: A randomized field trial. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, *75*(1-A(E)), No-Specified. http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc11&NEWS=N&AN=2014-99131-196

Marsh, D. (2017). *A systematic review and meta-analysis of randomized clinical trials of evidence-based practices through measured change of behavior for children in foster care* (Publication Number Dissertation Abstracts International: Section B: The Sciences and Engineering - Volume 77, Issue 12)

McGuire, A., Cho, B., Huffhines, L., Gusler, S., Brown, S., & Jackson, Y. (2018). The relation between dimensions of maltreatment, placement instability, and mental health among youth in foster care. *Child Abuse & Neglect, 86*, 10–21. https://doi.org/10.1016/j.chiabu.2018.08.012

Mezey, G., Robinson, F., Campbell, R., Gillard, S., Macdonald, G., Meyer, D., Bonell, C., & White, S. (2015). Challenges to undertaking randomised trials with looked after children in social care settings. *Trials, 16*(1), 1–15.

Moody, G., Brookes-Howell, L., Cannings-John, R., Channon, S., Coulman, E., Rees, A., Segrott, J., & Robling, M. (2021). What are the challenges when recruiting to a trial in children's social care? A qualitative evaluation of a trial of foster carer training. *Trials, 22*(1), 1–12.

Moore, G. F., Audrey, S., Barker, M., Bond, L., Bonell, C., Hardeman, W., Moore, L., O'Cathain, A., Tinati, T., Wight, D., & Baird,

J. (2015). Process evaluation of complex interventions: Medical research council guidance. *BMJ, 350*, h1258. https://doi.org/10.1136/bmj.h1258

Moore, G., Campbell, M., Copeland, L., Craig, P., Movsisyan, A., Hoddinott, P., Littlecott, H., O'Cathain, A., Pfadenhauer, L., Rehfuess, E., Segrott, J., Hawe, P., Kee, F., Couturiaux, D., Hallingberg, B., & Evans, R. (2021). Adapting interventions to new contexts—the ADAPT guidance. *BMJ, 374*, n1679. https://doi.org/10.1136/bmj.n1679

National Insitute for Health and Care Excellence. (2021). *Looked-After Children and Young People [F] Interventions to promote physical, mental, and emotional health and wellbeing of lookedafter children, young people and care leavers. NICE guideline NG205*. https://www.nice.org.uk/guidance/ng205/evidence/f-interventions-to-promote-physical-mental-and-emotional-health-and-wellbeing-of-lookedafter-children-young-people-and-care-leavers-pdf-333471052728

National Institute for Health and Care Excellence. (2021). *Looked-After children and young people: Interventions to promote physical, mental, and emotional health and wellbeing of lookedafter children, young people and care leavers. NICE guideline. NG205.*: Public Health England Retrieved from https://www.nice.org.uk/guidance/ng205/resources/lookedafter-children-and-young-people-pdf-66143716414405

O'Cathain, A., Croot, L., Duncan, E., Rousseau, N., Sworn, K., Turner, K. M., Yardley, L., & Hoddinott, P. (2019). Guidance on how to develop complex interventions to improve health and healthcare. *British Medical Journal Open, 9*(8), e029954. https://doi.org/10.1136/bmjopen-2019-029954

Oliver, K., Lorenc, T., Tinkler, J., & Bonell, C. (2019). Understanding the unintended consequences of public health policies: The views of policymakers and evaluators. *BMC Public Health, 19*(1), 1–9.

Oliver, K., Lorenc, T., & Tinkler, J. (2020). Evaluating unintended consequences: New insights into solving practical, ethical and political challenges of evaluation. *Evaluation, 26*(1), 61–75.

O'Neill, J., Tabish, H., Welch, V., Petticrew, M., Pottie, K., Clarke, M., Evans, T., Pardo, J. P., Waters, E., & White, H. (2014). Applying an equity lens to interventions: Using PROGRESS ensures consideration of socially stratifying factors to illuminate inequities in health. *Journal of Clinical Epidemiology, 67*(1), 56–64.

Pawson, R., Tilley, N., & Tilley, N. (1997). *Realistic evaluation*. Sage.

Price, J. M., Roesch, S., Walsh, N. E., & Landsverk, J. (2015). Effects of the KEEP foster parent intervention on child and sibling behavior problems and parental stress during a randomized implementation trial. *Prevention Science, 16*(5), 685–695. https://doi.org/10.1007/s11121-014-0532-9

Rob, T., Rhiannon, E., Sarah, M., Jane, N., Mike, R., Simone, W., Maria, B., Charlotte, W., Soo, V., & Melendez-Torres, G. J. (in press). Effectiveness of mental health and wellbeing interventions for children and young people in foster, kinship and residential care: Systematic review and meta-analysis. *Trauma, Violence, & Abuse*

Sandler, I., Wolchik, S. A., Cruden, G., Mahrer, N. E., Ahn, S., Brincks, A., & Brown, C. H. (2014). Overview of meta-analyses of the prevention of mental health, substance use, and conduct problems. *Annual Review of Clinical Psychology, 10*, 243–273. https://doi.org/10.1146/annurev-clinpsy-050212-185524

Skivington, K., Matthews, L., Simpson, S. A., Craig, P., Baird, J., Blazeby, J. M., Boyd, K. A., Craig, N., French, D. P., & McIntosh, E. (2021). A new framework for developing and evaluating complex interventions: Update of medical research council guidance. *BMJ*. https://doi.org/10.1136/bmj.n2061

Smith Dana, K., Leve Leslie, D., & Chamberlain, P. (2011). Preventing internalizing and externalizing problems in girls in foster care as they enter middle school: Impact of an intervention. *Prevention Science, 12*(3), 269–277. https://doi.org/10.1007/s11121-011-0211-z

Solomon, D. T., Niec, L. N., & Schoonover, C. E. (2017). The impact of foster parent training on parenting skills and child disruptive gehavior. *Child Maltreatment, 22*(1), 3–13. https://doi.org/10.1177/1077559516679514

Sullivan, A. L., & Simonson, G. R. (2016). A systematic review of school-based social-emotional interventions for refugee and war-traumatized youth. *Review of Educational Research, 86*(2), 503–530.

Taussig, H. N., Culhane Sara, E., Garrido, E., Knudtson Michael, D., & Petrenko Christie, L. M. (2013). Does severity of physical neglect moderate the impact of an efficacious preventive intervention for maltreated children in foster care? *Child Maltreatment, 18*(1), 56–64. https://doi.org/10.1177/1077559512461397

Taussig, H. N., Harpin, S. B., & Maguire, S. A. (2014). Suicidality among preadolescent maltreated children in foster care. *Child Maltreatment, 19*(1), 17–26. https://doi.org/10.1177/1077559514525503

Taussig, H. N., Weiler, L. M., Garrido, E. F., Rhodes, T., Boat, A., & Fadell, M. (2019). A Positive Youth Development approach to improving mental health outcomes for maltreated children in foster care: Replication and extension of an RCT of the Fostering Healthy Futures Program. *American Journal of Community Psychology, 64*(3–4), 405–417. https://doi.org/10.1002/ajcp.12385

Turner, W., & Macdonald, G. (2011). Treatment foster care for improving outcomes in children and young people: A systematic review. *Research on Social Work Practice, 21*(5), 501–527.

UNICEF. (1989). *The United Nations Convention on the Rights of the Child*.

Veinot, T. C., Mitchell, H., & Ancker, J. S. (2018). Good intentions are not enough: How informatics interventions can worsen inequality. *Journal of the American Medical Informatics Association, 25*(8), 1080–1088. https://doi.org/10.1093/jamia/ocy052

Weiler, L. M., Lee, S.-K., Zhang, J., Ausherbauer, K., Schwartz Sarah, E. O., Kanchewa Stella, S., & Taussig, H. N. (2021). Mentoring children in foster care: Examining relationship histories as moderators of intervention impact on children's mental health and trauma symptoms. *American Journal of Community Psychology*. https://doi.org/10.1002/ajcp.12549

Weiler, L. M., & Taussig, H. N. (2019). The moderating effect of risk exposure on an efficacious intervention for maltreated children. *Journal of Clinical Child & Adolescent Psychology, 48*, S194–S201. https://doi.org/10.1080/15374416.2017.1295379

Welsh Government. (2015). *Well-being of Future Generations (Wales) Act*. Cardiff: Welsh Government.

Xu, Y., & Bright, C. L. (2018). Children's mental health and its predictors in kinship and non-kinship foster care: A systematic review. *Children and Youth Services Review, 89*, 243–262. https://doi.org/10.1016/j.childyouth.2018.05.001

Yan, Y., & De Luca, S. (2021). Heterogeneity of treatment effects of PMTO in foster care: A latent profile transition analysis. *Journal of Child and Family Studies, 30*(1), 17–28. https://doi.org/10.1007/s10826-020-01798-y