Developmental trajectories of socio-emotional outcomes of children and young people in out-of-home care – Insights from data of Pathways of Care Longitudinal Study (POCLS)

Nan Hu [a,1], Yalemzewod Assefa Gelaw [a,b,1], Ilan Katz [c], Elizabeth Fernandez [d], Kathleen Falster [e], Mark Hanly [f], B.J. Newton [c], Jennifer Stephensen [d], Paul Hotton [g,h], Karen Zwi [a,h], Raghu Lingam [a,*]

[a] *Population Child Health (PCH) Research Group, School of Clinical Medicine, UNSW Medicine & Health, Bright Alliance, High Street, Randwick, New South Wales 2031, Australia*
[b] *Telethon Kids Institute, Perth Children's Hospital, 15 Hospital Avenue, Nedlands 6009, Western Australia, Australia*
[c] *Social Policy Research Centre, UNSW Sydney, High Street, Kensington 2052, Australia*
[d] *School of Social Sciences, UNSW Sydney, High Street, Kensington 2052, Australia*
[e] *School of Population Health, UNSW Sydney, High Street, Kensington 2052, Australia*
[f] *Centre for Big Data Research in Health, UNSW Sydney, High Street, Kensington 2052, Australia*
[g] *Discipline of Paediatrics & Child Health, School of Clinical Medicine, UNSW Medicine & Health, Bright Alliance, High Street, Randwick, New South Wales 2031, Australia*
[h] *Sydney Children's Hospitals Network (SCHN), High Street, Randwick, New South Wales 2031, Australia*

ARTICLE INFO

ABSTRACT

Background: There has been a limited understanding of the longitudinal trajectory and determinants of socio-emotional outcomes among children in out-of-home care (OOHC).

Objectives: This study aimed to examine child socio-demographics, pre-care maltreatment, placement, and caregiver factors associated with trajectories of socio-emotional difficulties of children in OOHC.

Participants and setting: The study sample ($n = 345$) included data from the Pathways of Care Longitudinal Study (POCLS), a prospective longitudinal cohort of children aged 3–17 years who entered the OOHC system in New South Wales (NSW) Australia, between 2010 and 2011.

Methods: Group-based trajectory models were used to identify distinct socio-emotional trajectory groups based on the Child Behaviour Check List (CBCL) Total Problem T-scores completed at all four Waves 1–4. Modified Poisson regression analysis was conducted to assess the association (risk ratios) of socio-emotional trajectory group membership with pre-care maltreatment, placement, and caregiver-related factors.

Results: Three trajectories of socio-emotional development were identified: 'persistently low difficulties' (average CBCL T-score changed from 40 to 38 over time), normal (average CBCL T-score changed from 52 to 55 over time), and clinical (average CBCL T-score remained at 68 over time) trajectories. Each trajectory presented a stable trend over time. Relative/kinship care, as

---

compared with foster care, was associated with the "persistently low" socio-emotional trajectory. Being male, exposure to ≥8 pre-care substantiated risk of significant harm (ROSH) reports, placement changes, and caregiver's psychological distress (more than two-fold increased risk) were associated with the clinical socio-emotional trajectory.

Conclusions: Early intervention to ensure children have a nurturing care environment and psychological support to caregivers are vital for positive socio-emotional development over time among children in long-term OOHC.

1. Introduction

1.1. Mental health among children in out-of-home care (OOHC) system

Mental health of children in OOHC is an international priority (Gilbert et al., 2009). In Australia, one-fifth of children aged 3–11 years in OOHC and 50% of adolescents aged 12–17 years have clinically significant socio-emotional difficulties (Moore et al., 2015). Socio-emotional wellbeing refers to the way a person perceives themselves and their environment, and it encompasses the capacity to adapt to and deal with adversity (resilience and coping skills) while leading a fulfilling life (AIHW, 2012).

Research has increasingly linked significantly higher levels of socio-emotional difficulties among children in OOHC to their early exposure to abuse and neglect, and associated family and community adversities such as socioeconomic disadvantage, parental substance abuse, and domestic and neighbourhood violence (Apos, Sebba, & Gardner, 2017; Evans, Brown, Rees, & Smith, 2017; Lehmann, Havik, Havik, & Heiervang, 2013). Children may also have compromised socio-emotional wellbeing when experiencing adversities in OOHC such as placement instability and assault by caregivers or peers living in the same household (especially sexual abuse) (Brown, Alderson, Kaner, McGovern, & Lingam, 2019; Johnson, Natalier, Liddiard, & Thoresen, 2011; Walsh, McHugh, Blunden, & Katz, 2018). Children whose caregivers receive adequate support from the OOHC systems may have better socio-emotional wellbeing than those whose caregivers do not (Rayburn, Withers, & McWey, 2018; Wells, Asif, Breen, & Zhou, 2020). Further, evidence has consistently shown that children have more socio-emotional difficulties if they enter care at a later age than a younger age, potentially due to the prolonged exposure to socio-economic adversities and maltreatment before an appropriate intervention takes place (Pritchett, Gillberg, & Minnis, 2013).

It has been widely documented that children in OOHC are more likely than their peers who have no contact with the OOHC system to have a range of mental health conditions (e.g., mood disorders, attachment difficulties, post-traumatic stress disorder or PTSD), deliberate self-harm or suicidal behaviours, substance abuse problems, behavioural difficulties, and a contact with the justice system (Cashmore, 2011; Fernandez, 2007; Gilbert et al., 2009; Hu, Taylor, Li, & Glauert, 2017; Tarren-Sweeney, 2008).

There has been an increasing number of children in need of OOHC in many countries including Australia. Between 2017 and 2020, the number of children in OOHC in Australia rose by 7 % from 43,100 to 46,000, although the rate remained stable at around 8 per 1000 children (Australian Institute of Health and Welfare, 2021). The rising number of children in OOHC has contributed to increasing strain on the OOHC system. A systematic inquiry into the lived experience of children and young people in the OOHC system in the State of Victoria Australia documented the increasing medical and developmental complexity of children entering OOHC over the past decade (Commission for Children and Young People, 2019). The inquiry pointed to significant system pressures such as under-funding of the child protection system compared to the rising number of investigations requested; unmet targets of recruitment of child protection workers, and a high attrition rate for child protection staff. The increase in the number of children entering care is mirrored internationally in the UK and the US (U.S. Department of Health & Human Services, 2022; Royal College of Paediatrics and Child Health, 2020).

1.2. Research gap

A recent review of longitudinal studies looking at the socio-emotional development of children in OOHC concluded that "growing up in care is generally neither reparative nor harmful for children who enter care following exposure to severe social adversity" (Goemans, van Geel, van Beem, & Vedder, 2016; Tarren-Sweeney & Goemans, 2019b). However, due to the dearth of longitudinal studies with adequate sample size, follow-up period or depth of data, what remains unclear is what characteristics related to children, their caregivers, and the care system are associated with stabilising, improving and worsening socio-emotional outcomes (i.e., decreasing and increasing emotional and behavioural difficulties). The answer to this question is important to the allocation of resources to best meet the needs of children.

1.3. Research aims

In order to better understand the socio-emotional needs of children in OOHC and inform resource allocation in the system, we aimed to identify groups of children with statistically and clinically distinct socio-emotional change patterns (i.e., trajectories) from their entry to care to up to 8 years later. We also examined key factors related to group allocation (or membership) of socio-emotional difficulties, including i) child demographics such as age at entry to OOHC, ii) pre-care exposure to abuse and neglect such as the number of pre-care allegations and substantiations of child maltreatment, iii) OOHC experience such as placement breakdown, and iv)

caregiver satisfaction with the support received and their psychological wellbeing. These factors were included based on their availability in the POCLS data and their importance for socio-emotional wellbeing of children in OOHC (McHugh, Blunden, & Katz, 2018; Tarren-Sweeney & Goemans, 2019b).

2. Methods

2.1. Data source and study sample

2.1.1. POCLS study (data source)

Data were analysed from the Pathways of Care Longitudinal Study (POCLS), a prospective longitudinal cohort of 4126 children (aged 0–17 years) who entered the OOHC system in New South Wales (NSW), Australia, between 2010 and 2011 (i.e., POCLS population cohort). Among these children, 2828 received final orders issued by the Children's Court by 30th April 2013 (i.e., POCLS final orders cohort). These children were eligible to participate in a POCLS interview. The POCLS team received consent to interview 1789 children (i.e., POCLS final orders interview cohort). Among these children, 1507 were interviewed at least once.

Most children entering OOHC in NSW are placed in family settings including relative/kinship (53 %) and foster (44 %) care, with only 3 % in residential care. Given the small number of children in residential care in the POCLS, we only analysed children in relative/kinship or foster care.

2.1.2. Study sample

A total of 734 children participated in all four Waves (i.e., Waves 1–4) of the POCLS ($n = 1285$ in Wave 1; $n = 1200$ in Wave 2; $n = 1033$ in Wave 3; $n = 962$ in Wave 4). In this study, we analysed a subset of 345 children. This is because we limited to children aged 3 years or older at Wave 1 ($n = 347$), because the Child Behaviour Check List (CBCL, the measure of socio-emotional wellbeing as described in Section 2.2) only applies to children ≥3 years of age. Additionally, we excluded two children who had a missing CBCL score at one Wave.

Our analyses of socio-emotional trajectory patterns were based on the longitudinal data collected across all four Waves for each child included in this study. We used unweighted POCLS data collected from face-to-face interviews with caregivers from June 2011 to November 2018, linked to the information on child protection reports and OOHC placements routinely collected by the NSW Department of Communities and Justice (DCJ) (NSW Department of Communities and Justice, 2020b, 2020c). Detailed methodology of the POCLS and ethics protocols followed have been reported previously (NSW Department of Communities and Justice, 2020b).

2.2. Measures of child socio-emotional wellbeing

Socio-emotional difficulties of children aged 3 to 17 years were measured using the CBCL completed by the caregivers across POCLS Waves 1 to 4. The CBCL yields T-scores standardised by age and gender (based on a norming sample, with the mean score of 50 and standard deviation of 10) for three outcomes, including total socio-emotional difficulties, internalising difficulties (mainly related to mood disorders such as depression and anxiety) and externalising difficulties (mainly related to behavioural problems) (Achenbach & Ruffle, 2000; NSW Department of Communities and Justice, 2020a). Children's socio-emotional outcomes were grouped into three levels based on the CBCL total T-score: (i) normal, if they had a T-score within 1 standard deviation of the mean (i.e., <60); (ii) borderline/vulnerable, if they had a T-score between 1 and 1.3 standard deviations of the mean (i.e., 60–63), and (iii) clinical, if they had a T-score >1.3 standard deviations of the mean (i.e., ≥64).

2.3. Factors at POCLS wave 1 (baseline)

We included factors available in the POCLS data which have been shown to be associated with socio-emotional difficulties among children in the OOHC system. These factors were identified as time-invariant covariates. We analysed factors at Wave 1 only to understand how the baseline characteristics were associated with subsequent socio-emotional change over time.

2.3.1. Child demographic factors

These variables included child's gender (female and male), Aboriginal status (non-Aboriginal and Aboriginal), and age at first entry into OOHC (<3 years, 3–5 years, and 6–11 years).

2.3.2. Child pre-care maltreatment factors

We analysed number of pre-care unsubstantiated risk of significant harm (ROSH) reports (categorised to 1, 2–3, 4–7, and 8 or more) and the number of pre-care substantiated ROSH reports (categorised to 0 or no substantiated ROSH reports, 1, 2–3, 4–7, and 8 or more). We also examined the predominant type of pre-care maltreatment, including physical abuse alone, emotional/psychological abuse alone, sexual abuse alone, neglect alone, and multiple types of abuse. These factors were identified using the child protection administrative data.

2.3.3. Placement-related factors

Placement type was defined according to the placement arrangement experienced by the child at the time of the interview (foster care, relative/kinship care). The placement types also included respite and emergency placements. The total number of placements

experienced by a child until each Wave was categorised into groups as 1, 2, 3, 4, and 5 or more.

2.3.4. Caregiver-related factors

Caregiver psychological distress level in the 30 days prior to each interview was measured using the Kessler Psychological Distress Scale (K10) and was categorised as low and moderate/high levels of psychological distress, respectively, based on cut-offs provided by Kessler et al. (2003). Other caregiver-related covariates included whether the caregiver was satisfied with their accessibility to caseworkers (i.e., satisfaction with being able to reach caseworkers when needed) and the general assistance from caseworker. We considered responses "Very satisfied" and "Satisfied" as caregivers being satisfied with the support, and responses "Unsure", "Dissatisfied", and "Very dissatisfied" as caregivers being dissatisfied/unsure about the support. We also analysed caregiver's highest educational attainment (high school and below, certificate/diploma, and Bachelor and above) and annual household income categorised based on the Australian personal income cut-offs (<$60,000, $60,000–$99,999, and $100,000 or more) (Australian Bureau of Statistics, 2017).

2.4. Statistical analysis

We described the characteristics of the study sample in comparison to broader POCLS cohorts. To explore the patterns of socioemotional difficulties over time, we used group-based trajectory modelling (GBTM) using the Stata function "traj" (Jones & Nagin, 2013). This analytic approach has been widely used to identify distinct subgroups of individuals, within each of which individuals have the same trajectory of developmental outcomes over time (Nagin, 2005). We analysed the trajectories based on the CBCL T-scores

Table 1
Child's demographics and pre-care experiences by participation status in POCLS.

Characteristics	Children with CBCL assessments at all four Waves of POCLS (current study sample)	Children who participated in all four Waves of POCLS	Children who participated in at least one Wave of POCLS
	N (column %)	N (column %)	N (column %)
Total	345 (100)	734 (100)	1507 (100)
Age at first entry to care (years)			
<3	84 (24.3)	471 (64.2)	804 (53.4)
3–5	147 (42.6)	147 (20.0)	283 (18.8)
6–11	114 (33.0)	116 (15.8)	323 (21.4)
12–17	0 (0)	0 (0)	97 (6.4)
Age at Wave 1 interview (years)			
<3[a]	0 (0)	387 (52.7)	577 (38.3)
3–5	211 (61.2)	211 (28.7)	423 (28.1)
6–11	124 (35.9)	126 (17.2)	318 (21.1)
12–17	10 (2.9)	10 (1.4)	189 (12.5)
Child's sex			
Male	174 (50.4)	371 (50.5)	748 (49.6)
Female	171 (49.6)	363 (49.5)	759 (50.4)
Aboriginal status			
Aboriginal	137 (39.7)	288 (39.2)	586 (38.9)
Non-Aboriginal	208 (60.3)	446 (60.8)	921 (61.1)
Number of pre-care unsubstantiated ROSH reports			
1	10 (2.9)	82 (11.2)	138 (9.2)
2 to 3	28 (8.1)	179 (24.4)	311 (20.6)
4 to 7	80 (23.2)	210 (28.6)	394 (26.1)
8 or more	227 (65.8)	262 (35.7)	656 (43.5)
Number of pre-care substantiated ROSH reports			
None	24 (7.0)	83 (11.3)	149 (9.9)
1	80 (23.2)	233 (31.7)	418 (27.7)
2 to 3	100 (29.0)	221 (30.1)	457 (30.3)
4 to 7	79 (22.9)	135 (18.4)	306 (20.3)
8 or more	62 (18.0)	71 (9.7)	172 (11.4)
Predominant type of pre-care maltreatment			
Physical abuse	45 (13.0)	174 (23.7)	293 (19.4)
Emotional/psychological abuse	–[b]	–	52 (3.5)
Sexual abuse	–	–	16 (1.1)
Neglect	96 (27.8)	182 (24.8)	391 (25.9)
Multiple types of abuse	185 (53.6)	340 (46.3)	750 (49.8)

[a] No children in the study sample were <3 years of age at Wave 1 interview because the CBCL is restricted to children ≥3 years.
[b] Numbers <5 and the second smallest numbers are not displayed to avoid the possibility of identifying individuals. CBCL: Child Behaviour Check List. ROSH: Report of Significant Harm.

across all four POCLS Waves (i.e., Waves 1–4) for each child.

Since child's age plays a key role in socio-emotional development, we divided the cohort of 345 children into three groups based on their age at first entry into care: < 3, 3–5, and 6–11 years of age (11 years was the oldest age in the cohort). We conducted the stratified GBTM analysis of CBCL total T-scores for each age group. This analysis provided more nuanced understanding of the children's socio-emotional trajectories across developmental stages by controlling for age at entry into care.

Trajectory models were conducted as a function of the mean age of children at each interview. The choice of number of trajectories was based on the Bayesian Information Criterion (BIC; the lower BIC, the better model fit). We also calculated the average posterior probabilities of group membership. The posterior probability is a product of the GBTM process, and it shows the likelihood of each individual belonging to a specific socio-emotional trajectory group, given the individual's CBCL T-scores across Waves. An individual is assigned to a group for which this individual has the highest posterior probability. For example, if a three-group model is fitted, each child will have three posterior probabilities, with one for each trajectory group (these three probabilities add up to 100 %). The average posterior probability for a trajectory group was calculated as the mean posterior probability of all the individuals assigned to this group. Nagin (2005, p. 88) provides a rule-of-thumb for a good model fit: the average posterior probability is >70 % for all trajectory groups.

We calculated the proportion of children in each trajectory group specific to each level of a covariate included in this study. We calculated both odds ratios (OR) and risk ratios (RR) to measure the association between baseline covariates and subsequent trajectory group membership. To ensure adequate numbers for regression analysis, we created broader categories for certain covariates. For example, we combined 1 and 2–3 ROSH reports together to form three levels, i.e.,1–2 (as reference), 3–4, and ≥ 5. We conducted multinomial logistic regression analysis to calculate ORs and modified Poisson regression analysis to calculate RRs (Zou, 2004). We calculated crude risk measures using the univariable regression models and adjusted risk measures using the multivariable regression models controlling for covariates which had a univariable (or crude) p value being <0.10. We calculated 95 % confidence intervals (CIs) of the risk measures using the Wald's estimates. We used Stata statistical software (StataCorp. 2019. Release 16. College Station, TX: StataCorp LLC.) to undertake GBTM analysis and SAS (Enterprise Guide) statistical software version 7.1 (SAS Institute Inc., Cary, NC, USA) in all the other analyses.

3. Results

3.1. Baseline characteristics of study sample

Of the study sample ($n = 345$), the mean (standard deviation or SD) age at first entry to OOHC was 4.6 (2.6) years. In terms of the three age groups for trajectory analysis, there were 84 (24.3 %) children <3 years at first entry to OOHC, 147 (42.6 %) children 3–5 years and 114 (33.0 %) children 6–11 years, with no children aged ≥12 years.
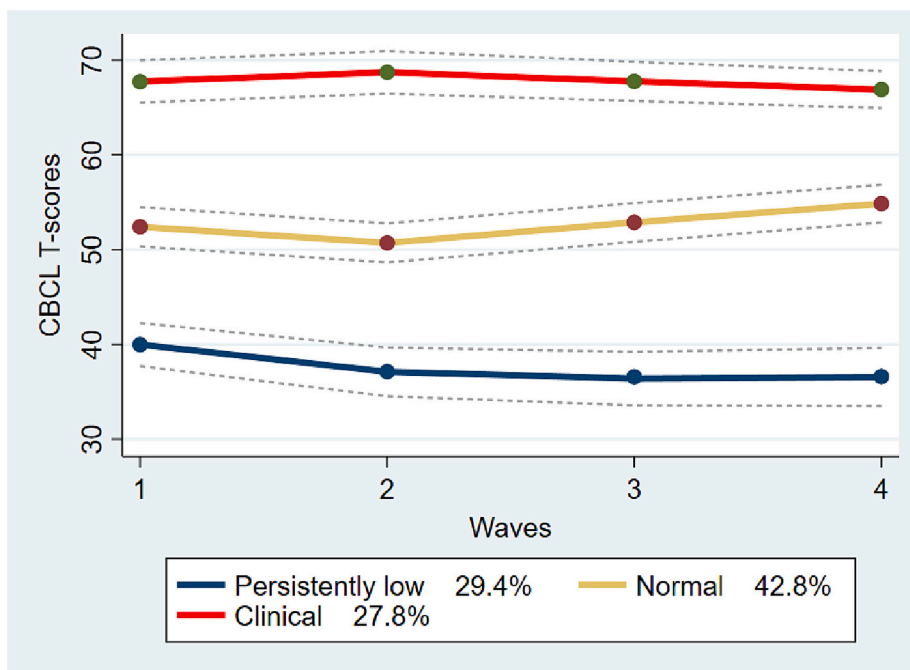

Fig. 1. Socio-emotional trajectories of children with all four Waves of the CBCL total T-scores in the POCLS ($n = 345$).
CBCL: Child Behaviour Check List. POCLS: Pathways of Care Longitudinal Study.
'Persistently low' refers to the 'persistently low difficulties' group.

At Wave 1 ($n = 345$), 211 (61.2 %) children were aged 3–5 years and 134 (38.8 %) 6–17 years, with only 10 (2.9 %) children aged 12–17 years (Table 1). There were similar numbers of males ($n = 174$, 50.4 %) and females ($n = 171$, 49.6 %), and 137 (39.7 %) Aboriginal children. In terms of pre-care experiences, two-thirds ($n = 227$, 65.8 %) of the study sample had 8 or more unsubstantiated ROSH reports, and 40.9 % ($n = 141$) and 18 % ($n = 62$) had ≥ 4 and ≥ 8 substantiated ROSH reports, respectively. More than half of the study sample ($n = 185$, 53.6 %) experienced multiple types of abuse before entry to OOHC, followed by 96 (27.8 %) and 45 (13.0 %) children predominantly experiencing neglect and physical abuse, respectively.

There was nearly the same distribution by child's sex and Aboriginality among the study sample and those who participated in all four Waves and those who participated in at least one Wave, with around 50 % of the participants being females and around 39 % being Aboriginal. Because this study only focused on children older than 3 years at Wave 1 due to the age requirement of CBCL, there were more children aged ≥ 3 years at entry to OOHC ($n = 261$, 75.6 %) in the study sample than children in all four Waves ($n = 263$, 35.8 %) and those in at least one Wave ($n = 703$, 46.6 %) (Table 1). Regarding pre-care experiences, more children in the study sample were subject to ≥ 8 unsubstantiated ROSH reports (65.8 %) than those in all four Waves ($n = 262$, 35.7 %) and those in at least one Wave ($n = 656$, 43.5 %). This was also seen when looking at children subject to ≥ 4 substantiated ROSH reports, with 40.9 % of the study sample compared to 28.1 % ($n = 206$) of children in all four Waves and 31.7 % ($n = 478$) of those in at least one Wave. Additionally, more children (53.6 %) in the study sample experienced multiple types of abuse than those in all four Waves ($n = 340$, 46.3 %) and those in at least one Wave ($n = 750$, 49.8 %). A further comparison shows that the distribution by child's sex was similar among the study sample and the POCLS population cohort, final orders cohort, and final orders interview cohort; whereas more children were Aboriginal in the study sample (39.7 %) compared to these POCLS cohorts (32–34 %).

3.2. Socio-emotional trajectory groups

3.2.1. Trajectory groups of total socio-emotional difficulties

Models with three to four trajectories were tested. The three-group model best fitted the data with a much lower BIC score (-5203.70) compared with the four-group model (BIC $= -790.81$). For the three-group model, the average posterior probability for the three trajectory groups ranged from 0.91 to 0.93, indicating a good fit.

Fig. 1 shows three distinct patterns of socio-emotional outcomes over time. The first group included 102 children, who had a persistently low mean CBCL total T-score, starting at 40 at Wave 1 followed by a slight decrease across Waves, ending at 38 at Wave 4. We considered this group the "persistently low socio-emotional difficulties" group (referred to as 'persistently low difficulties' hereinafter). The second group, including 146 children, had a persistently medium mean CBCL total T-score, starting at 52 at Wave 1 followed by a slight increase from Waves 2 to 4, ending at 55 at Wave 4. We considered this group the "normal" group, given their mean total T-score approximated to 50, which is the mean CBCL total T-score of the norming population. The third group, including 97 children, had a persistently high mean total T-score over time, starting at 68 at Wave 1 and remaining at this high level across Waves. We considered this group the "clinical" group, as the score was >64, which was the cut-off for clinical level of socio-emotional difficulties by CBCL.

We found the best solution of three groups (i.e., persistently low difficulties, normal, and clinical) for socio-emotional trajectories in the stratified analysis by child's age at entry into OOHC: children who entered OOHC at the age of <3 years, 3–5 years, and 6–11 years (Supplement 1).
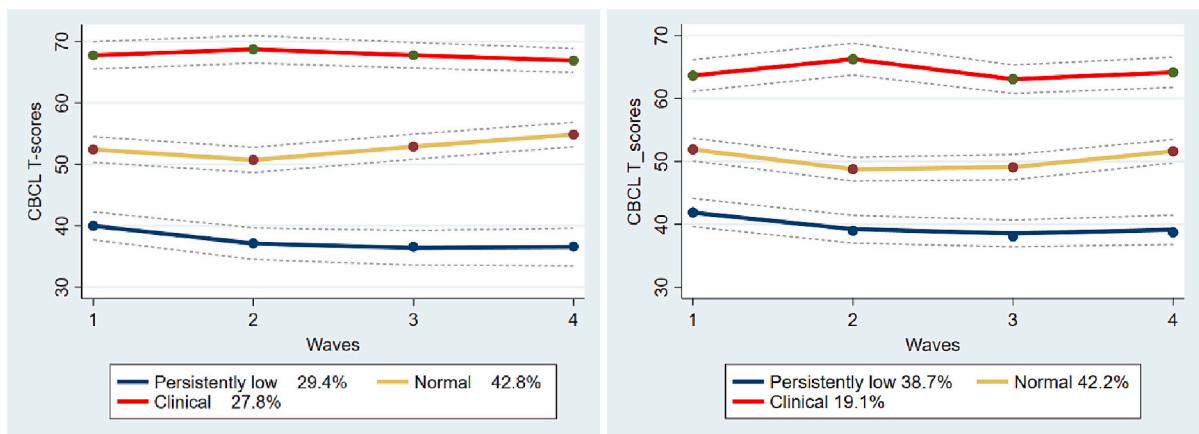

Fig. 2. Internalising (left-handed) and externalising (right-handed) trajectory groups of children with all four Waves of the CBCL T-scores in the POCLS ($n = 345$).
CBCL: Child Behaviour Check List. POCLS: Pathways of Care Longitudinal Study.
'Persistently low' refers to the 'persistently low difficulties' group.

Table 2

Baseline factors of children and caregivers in different socio-emotional trajectory groups (*n* = 345).

Baseline factors of children and caregivers[a]	All (n = 345)	"Persistently low difficulties" group (*n* = 102)	Normal group (*n* = 146)	Clinical group (*n* = 97)	"Persistently low difficulties" & normal groups combined (*n* = 248)
	N (row %)	N (row %)	N (row %)	N (row %)	N (row %)
Child's age at first entry into care (years)					
<3	84 (100)	28 (33.33)	35 (41.67)	21 (25.00)	63 (75.00)
3–5	147 (100)	34 (23.13)	71 (48.30)	42 (28.57)	105 (71.43)
6–11	114 (100)	40 (35.09)	40 (35.09)	34 (29.82)	80 (70.18)
Child's sex					
Male	174 (100)	51 (29.31)	66 (37.93)	57 (32.76)	117 (67.24)
Female	171 (100)	51 (29.82)	80 (46.78)	40 (23.39)	131 (76.61)
Child's Aboriginal background					
Aboriginal	137 (100)	48 (35.04)	48 (35.04)	41 (29.93)	96 (70.07)
Non-Aboriginal	208 (100)	54 (25.96)	98 (47.12)	56 (26.92)	152 (73.08)
Number of pre-care unsubstantiated ROSH reports					
1	10 (100)	–[b]	–	–	7 (70.00)
2 to 3	28 (100)	–	–	–	18 (64.29)
4 to 7	80 (100)	28 (35.00)	34 (42.50)	18 (22.50)	62 (77.50)
8 or more	227 (100)	63 (27.75)	98 (43.17)	66 (29.07)	161 (70.93)
Number of pre-care substantiated ROSH reports					
None	24 (100)	6 (25.00)	13 (54.17)	5 (20.83)	19 (79.17)
1	80 (100)	27 (33.75)	34 (42.50)	19 (23.75)	61 (76.25)
2 to 3	100 (100)	32 (32.00)	39 (39.00)	29 (29.00)	71 (71.00)
4 to 7	79 (100)	26 (32.91)	38 (48.10)	15 (18.99)	64 (81.01)
8 or more	62 (100)	11 (17.74)	22 (35.48)	29 (46.77)	33 (53.23)
Predominant type of pre-care maltreatment					
Physical abuse	45 (100)	16 (35.56)	22 (48.89)	7 (15.56)	38 (84.44)
Emotional/psychological abuse	–	–	–	–	–
Sexual abuse	–	–	–	–	–
Neglect	96 (100)	34 (35.42)	36 (37.50)	26 (27.08)	70 (72.92)
Multiple types of abuse	185 (100)	49 (26.49)	82 (44.32)	54 (29.19)	131 (70.81)
Number of placements					
1	56 (100)	19 (33.93)	25 (44.64)	12 (21.43)	44 (78.57)
2	83 (100)	27 (32.53)	41 (49.40)	15 (18.07)	68 (81.93)
3	68 (100)	18 (26.47)	33 (48.53)	17 (25.00)	51 (75.00)
4	57 (100)	20 (35.09)	13 (22.81)	24 (42.11)	33 (57.89)
5 or more	81 (100)	18 (22.22)	34 (41.98)	29 (35.80)	52 (64.20)
Placement types					
Foster care	150 (100)	33 (22.00)	73 (48.67)	44 (29.33)	106 (70.67)
Relative/kinship care	195 (100)	69 (35.57)	73 (37.63)	53 (26.80)	142 (73.20)
Caregiver's psychological distress					
Low	256 (100)	90 (35.16)	114 (44.53)	52 (20.31)	204 (79.69)
Moderate/high	83 (100)	12 (14.46)	29 (34.94)	42 (50.60)	41 (49.40)
Unknown	6 (100)	0 (0.00)	3 (50.00)	3 (50.00)	3 (50.00)
Caregiver's satisfaction with general assistance from caseworker					
Satisfied	196 (100)	54 (27.55)	88 (44.90)	54 (27.55)	142 (72.45)
Dissatisfied/Unsure	149 (100)	48 (32.21)	58 (38.93)	43 (28.86)	106 (71.14)
Caregiver's satisfaction with accessibility to caseworker					

Table 2 (*continued*)

Baseline factors of children and caregivers[a]	All (n = 345)	"Persistently low difficulties" group (n = 102)	Normal group (n = 146)	Clinical group (n = 97)	"Persistently low difficulties" & normal groups combined (n = 248)
	N (row %)	N (row %)	N (row %)	N (row %)	N (row %)
Satisfied	211 (100)	60 (28.44)	96 (45.50)	55 (26.07)	156 (73.93)
Dissatisfied/Unsure	133 (100)	41 (30.83)	50 (37.59)	42 (31.58)	91 (68.42)
Unknown	1 (100)	1 (100.00)	0 (0.00)	0 (0.00)	1 (100.00)
Caregiver's highest education					
Year 12 and below	173 (100)	56 (32.37)	70 (40.46)	47 (27.17)	126 (72.83)
Diploma/certificate	123 (100)	34 (27.64)	56 (45.53)	33 (26.83)	90 (73.17)
Bachelor and above	49 (100)	12 (24.49)	20 (40.82)	17 (34.69)	32 (65.31)
Caregiver's annual income					
<$60,000	154 (100)	47 (30.52)	61 (39.61)	46 (29.87)	108 (70.13)
$60,000 to $99,999	78 (100)	15 (19.23)	37 (47.44)	26 (33.33)	52 (66.67)
$100,000 or more	79 (100)	23 (29.11)	35 (44.30)	21 (26.58)	58 (73.42)
Unknown	34 (100)	17 (50.00)	13 (38.24)	4 (11.76)	30 (88.24)

[a] Baseline characteristics were measured at Wave 1 of the Pathways of Care Longitudinal Study (POCLS). ROSH refers to risk of significant harm.
[b] Numbers <5 and the second smallest numbers are not displayed to avoid the possibility of identifying individuals; however we still present the numbers when it occurred to "Unknown" category. ROSH: Report of Significant Harm. CBCL: Child Behaviour Check List.

3.2.2. Trajectory groups of internalising and externalising difficulties

The three-group solution of "persistently low difficulties", "normal", and "clinical" socio-emotional trajectories also provided the best fit to the data when we examined the trajectories of internalising and externalising difficulties of children in OOHC, respectively (Fig. 2). For internalising difficulties, the proportion of children assigned to each trajectory was 38.7 % for the "persistently low difficulties", 42.2 % for the normal, and 19.1 % for the clinical group. For externalising difficulties, the proportion was 38.9 %, 39.4 % and 22.8 %, respectively.

3.3. Characteristics of children and caregivers in different socio-emotional trajectory groups

3.3.1. Proportion of children assigned to different trajectory groups by covariate

Children aged 3–5 years (28.6 %) and 6–11 years (29.8 %) at entry to OOHC were more likely to be in the clinical trajectory group than children aged <3 years at entry to care (25.0 %) (Table 2). Males (32.8 %) were more likely than females (23.4 %) to be in the clinical group. Compared to non-Aboriginal children, Aboriginal children were more likely to be in either the "persistently low difficulties" group (35.0 % versus 26.0 %) or the clinical group (29.9 % versus 26.9 %) than the normal group. Children were generally more likely to be in the clinical trajectory group when subject to more pre-care substantiated ROSH reports, from 20.8 % for children with no substantiated report to 46.8 % for children with ≥8 substantiated reports. This was not evident for the number of unsubstantiated ROSH reports.

Regarding the type of pre-care maltreatment, children who predominantly experienced emotional abuse or sexual abuse were more likely to be in the clinical group, with both being ≥50 %; however, the numbers of these children were low (<20 for emotional abuse and <5 for sexual abuse – exact frequencies are not presented as we follow the small cell suppression rule to avoid the possibility of identifying individuals). Children who experienced predominantly neglect (27.1 %) or multiple types of abuse (29.2 %) were more likely to be in the clinical trajectory group compared to those being subject to physical abuse alone (15.6 %).

Overall, the proportion of children in the clinical trajectory group increased with higher numbers of placements at baseline, from 21.4 % of children who had experienced one placement to 42.1 % and 35.8 % of children who had experienced 4 and ≥5 placements, respectively. Compared to children in relative/kinship care, those in foster care at baseline were less likely to be in the "persistently low difficulties" trajectory group (22.0 % versus 35.6 %) and slightly more likely to be in the clinical group (29.3 % versus 26.8 %). Half of children living with a caregiver who had moderate to high levels of psychological distress (50.6 %) at baseline were in the clinical trajectory group, compared to 20.3 % of children living with a caregiver who had a low level of distress. Children whose caregiver was unsatisfied/unsure with the accessibility to or the general assistance from caseworkers were somewhat more likely to be in the clinical group, compared to children whose caregiver was satisfied with this support. Further, more children were in the clinical group, when their caregivers' highest educational attainment was Bachelor or above (34.7 %) or the caregivers' annual income was within the middle level (i.e., $60,000 to $99,999, proportion = 33.3 %).

3.3.2. Risk ratios (RRs) from regression analysis

We calculated both RRs and ORs to measure the likelihood of children being in one trajectory group in reference to the other. We only describe RRs in this section, as the ORs may exaggerate the relative risk of children in the clinical group, likely because of the

Table 3

Association (risk ratios or RRs) between children's and caregivers' baseline characteristics including demographics, pre-care maltreatment, placement, and caregiver factors and trajectory group membership (*n* = 345).

Baseline characteristics of children and caregivers[a]	Risk ratios of children being assigned to the "Normal" or the "Clinical" group, with the "Persistently low difficulties" group as reference				Risk ratios of children being assigned to the "Clinical" group, with the "Persistently low difficulties" and the "Normal" groups combined (i.e., non-clinical) as reference	
	Normal group		Clinical group		Clinical group	
	Crude RR[2] (95%CI)	Adjusted RR[b] (95%CI)	Crude RR (95% CI)	Adjusted RR (95%CI)	Crude RR (95% CI)	Adjusted RR (95%CI)
Age at entry into care (years)						
<3 (reference)	1		1		1	
3–5	1.22 (0.94, 1.57)		1.29 (0.88, 1.89)		1.14 (0.73, 1.79)	
6–11	0.90 (0.66, 1.23)		1.07 (0.71, 1.61)		1.19 (0.75, 1.90)	
Child's sex						
Male (reference)	1		1		1	1
Female	1.08 (0.88, 1.34)		0.83 (0.62, 1.12)		0.71 (0.51, 1.01)	0.67 (0.48, 0.95)*
Aboriginal background						
Aboriginal	0.78 (0.61, 0.98)*	0.81 (0.64, 1.03)	0.90 (0.68, 1.21)		1.11 (0.79, 1.56)	
Non-Aboriginal (reference)	1	1	1		1	1
Number of pre-care substantiated ROSH reports						
None	1.24 (0.88, 1.74)		1.01 (0.51, 2.00)	0.76 (0.44, 1.33)	0.78 (0.35, 1.77)	0.75 (0.37, 1.51)
1–3 (reference)	1		1	1	1	1
4–7	1.07 (0.83, 1.38)		0.82 (0.52, 1.28)	0.83 (0.54, 1.28)	0.71 (0.43, 1.19)	0.78 (0.47, 1.31)
8 or more	1.21 (0.91, 1.60)		1.62 (1.22, 2.15)***	1.59 (1.17, 2.16)**	1.75 (1.22, 2.51)**	1.63 (1.11, 2.40)*
Predominant type of pre-care maltreatment						
Physical abuse (reference)	1		1		1	1
Emotional/psychological abuse	1.23 (0.72, 2.12)		2.63 (1.32, 5.25)**	2.39 (1.28, 4.47)**	3.43 (1.50, 7.86)**	2.27 (1.06, 4.85)*
Sexual abuse	0.86 (0.21, 3.55)		2.19 (0.80, 6.02)	1.82 (0.75, 4.45)	3.21 (0.97, 10.60)	3.33 (1.09, 10.18)*
Neglect	0.89 (0.62, 1.27)		1.42 (0.72, 2.82)	1.32 (0.74, 2.36)	1.74 (0.82, 3.71)	1.4 (0.69, 2.82)
Multiple types of abuse	1.08 (0.80, 1.46)		1.72 (0.90, 3.28)	1.60 (0.91, 2.82)	1.88 (0.92, 3.84)	1.54 (0.81, 2.95)
Number of placements						
1–2 (reference)	1		1	1	1	1
3–4	0.93 (0.72, 1.19)		1.40 (0.97, 2.03)	1.19 (0.84, 1.68)	1.69 (1.11, 2.57)*	1.58 (1.04, 2.40)*
5 or more	1.11 (0.86, 1.43)		1.67 (1.15, 2.43)**	1.40 (0.97, 2.02)	1.84 (1.18, 2.88)**	1.75 (1.11, 2.76)*
Placement type						
Foster	1.34 (1.09, 1.64)**	1.43 (1.15, 1.77)**	1.33 (1.00, 1.76)*	1.87 (1.35, 2.59)***	1.09 (0.78, 1.54)	
Relative/Kinship (reference)	1	1	1	1	1	
Caregiver stress level						
Low (reference)	1	1	1	1	1	1
Moderate/High	1.27 (1.00, 1.60)*	1.30 (1.03, 1.64)*	2.12 (1.64, 2.75)***	2.43 (1.85, 3.20)***	2.49 (1.8, 3.44)***	2.29 (1.65, 3.16)***
Satisfaction with general assistance from caseworker						
Satisfied (reference)	1		1		1	
Dissatisfied/Unsure	0.88 (0.71, 1.10)		0.95 (0.71, 1.26)		1.05 (0.75, 1.47)	
Satisfaction with accessibility to caseworker						
Satisfied (reference)	1		1		1	
Dissatisfied/Unsure	0.89 (0.71, 1.12)		1.06 (0.80, 1.41)		1.21 (0.86, 1.70)	
Caregiver's highest education						

(continued on next page)

Table 3 (*continued*)

Baseline characteristics of children and caregivers[a]	Risk ratios of children being assigned to the "Normal" or the "Clinical" group, with the "Persistently low difficulties" group as reference				Risk ratios of children being assigned to the "Clinical" group, with the "Persistently low difficulties" and the "Normal" groups combined (i.e., non-clinical) as reference	
	Normal group		Clinical group		Clinical group	
	Crude RR[2] (95%CI)	Adjusted RR[b] (95%CI)	Crude RR (95% CI)	Adjusted RR (95%CI)	Crude RR (95% CI)	Adjusted RR (95%CI)
High school and below (reference)	1		1		1	
Diploma/certificate	1.12 (0.89, 1.40)		1.08 (0.78, 1.49)		0.99 (0.68, 1.44)	
Bachelor and above	1.13 (0.82, 1.53)		1.28 (0.89, 1.86)		1.28 (0.81, 2.01)	
Caregiver's annual income						
<$60,000 (reference)	1	1	1	1	1	1
$60,000 to $99,999	1.26 (0.99, 1.60)	1.11 (0.87, 1.42)	1.28 (0.94, 1.75)	1.31 (0.93, 1.84)	1.12 (0.75, 1.66)	1.21 (0.80, 1.83)
$100,000 or more	1.07 (0.82, 1.39)	0.89 (0.68, 1.16)	0.96 (0.67, 1.40)	0.80 (0.57, 1.11)	0.89 (0.57, 1.38)	0.77 (0.50, 1.16)
Unknown	0.77 (0.49, 1.19)	0.76 (0.49, 1.19)	0.39 (0.16, 0.95)*	0.44 (0.14, 1.36)	0.39 (0.15, 1.02)	0.44 (0.14, 1.42)

[a] Baseline characteristics were measured at Wave 1 of the Pathways of Care Longitudinal Study (POCLS).
[b] Crude risk ratios (RRs) were calculated using the univariable modified Poisson regression models and adjusted RRs were derived from multi-variable modified Poisson regression controlling for covariates which had a univariable *p* value < 0.10. * *p* < .05, ** *p* < .01, *** *p* < .001. RR: Risk ratio. ROSH: Report of Significant Harm. CBCL: Child Behaviour Check List.

small cell sizes related to certain covariates and the relatively common event of the children being in the clinical trajectory group (i.e., the proportion was >20 %). We first report RRs of children being in the normal group and the clinical group, respectively, in reference to children being in the "persistently low difficulties" group. This is because the three trajectory groups solution offered the best model fit. We then report RRs of children being in the clinical group, compared with children being in the "persistently low difficulties" and normal groups combined, i.e., non-clinical group, because these results may be more clinically relevant.

3.3.2.1. Risk ratios with "persistently low difficulties" trajectory group as the reference. Regarding membership to the *normal* trajectory group in reference to the "persistently low difficulties" trajectory group, children in foster care at baseline had a 43 % (95%CI 15–77 %, *p* = .0012) increased likelihood to be in the normal group than those in relative/kinship care, after controlling for covariates (Table 3). Additionally, children whose caregiver had moderate/high psychological levels of distress had a 30 % (95%CI 3–64 %, *p* = .029) increased likelihood to be in the normal group than those whose caregiver had a low level of distress.

Regarding membership in the *clinical* trajectory group in reference to the "persistently low difficulties" trajectory group, children who were subject to ≥8 pre-care substantiated ROSH reports had a 59 % (95%CI 17–116 %, *p* = .0031) increased risk of being in the clinical group than those subject to 1–3 substantiated ROSH reports, after controlling for covariates (Table 3). Children in foster care at baseline had an adjusted 87 % (95%CI 35–159 %, *p* = .0002) increased risk of being in the clinical group than those in relative/kinship care. Further, children whose caregiver had moderate/high levels of distress had a more than two-fold increased risk of being in the clinical group than those whose caregiver had a low level of distress (adjusted RR or ARR = 2.43, 95%CI 1.85–3.20, *p* < .0001). Additionally, children who predominantly experienced emotional abuse at baseline had a 2.4-fold increased risk of being in the clinical group than children who predominantly experienced physical abuse (ARR = 2.39, 95%CI 1.28–4.47, *p* = .0064); however, the number of children predominantly subject to emotional abuse was small (the frequency was <20).

3.3.2.2. Risk ratios with non-clinical trajectory group as the reference. As mentioned above, the non-clinical trajectory group included children assigned to the "persistently low difficulties" group and those in the normal group. Compared to this non-clinical group, females had a 33 % (95%CI 5–52 %, *p* = .025) reduced risk of being in the clinical trajectory group than males. Children subject to ≥8 pre-care substantiated ROSH reports had a 63 % (95%CI 11–140 %, *p* = .013) increased risk of being in the clinical group than those subject to 1–3 substantiated reports. Children who had experienced 3–4 placements and ≥ 5 placements had 58 % (95%CI 4–140 %, *p* = .030) and 75 % (95%CI 11–176 %, *p* = .017) increased risk of being in the clinical group, respectively, compared with those who had experienced 1–2 placements. Caregiver's moderate/high levels of psychological distress was associated with over two-fold increased risk of being in the clinical group (ARR = 2.29, 95%CI 1.65–3.16, *p* < .0001). Additionally, children who predominantly experienced emotional abuse and sexual abuse had over two-fold and over three-fold increased risk of being in the clinical group, respectively, than those who experienced physical abuse alone (Table 3); however, the sample sizes for these two groups of children were low.

4. Discussion

This study explored trajectories of socio-emotional difficulties of children aged 3–17 years in relative/kinship and foster care in

NSW Australia. We found three distinct socio-emotional trajectories, and each of these trajectories suggested a stable socio-emotional state persistently over time. This finding is supported by the meta-analysis of Goemans, van Geel, and Vedder (2015) and a narrative review of Tarren-Sweeney and Goemans (2019a, 2019b). These reviews found no evidence that OOHC exerts a general, population-level effect on the mental health of children who enter care following exposure to maltreatment. This is potentially due to complex dynamic mechanisms that shape the developmental trajectories as children grow up in care and lingering detrimental effects of early adversities (Li & Godinet, 2014; Sonuga-Barke et al., 2017). This current research expanded the previous literature by exploring a range of factors that may be associated with the socio-emotional development over time among children in OOHC.

Our findings show that more than a quarter of children in the study sample placed in OOHC experienced clinical levels of socio-emotional difficulties that persisted over time. However, this research also shows nearly 30 % of children displayed persistently low socio-emotional difficulties. Compared to children in the clinical trajectory group, children in the "persistently low difficulties" group were more likely to have less pre-care substantiated allegations of maltreatment. This finding has highlighted the importance of providing children who were maltreated with early intervention to minimise their exposure to adverse experiences and a nurturing care environment to promote their socio-emotional wellbeing. There has been increasing research on resilience of children in care, using the ecological framework involving different systems that influence children's wellbeing (Sattler & Font, 2018). It has been shown that positive socio-emotional development of children in care is associated with cognitive stimulation and emotional support the children receive from a caring environment and their relationship with caregivers (Fernandez, 2006; Gartland et al., 2019; Landry, Smith, & Swank, 2006; Sattler & Font, 2018).

We found that compared to children in the clinical trajectory group, children in the "persistently low difficulties" group were more likely to live in relative/kinship care and/or with a caregiver with low psychological distress compared to children in foster care. Research has shown that children placed with kin have better behavioural and mental health outcomes (Tamara Fuller et al., 2017; Winokur, Holtan, & Batchelder, 2018). This might be because children in kinship care are more likely to maintain family contact and social and cultural connections, and receive more support from their siblings and other family members than those in foster care (Burke & Paxman, 2008; Hallett, Garstang, & Taylor, 2021). Such connections and support could play an important role in improving the socio-emotional development of children in OOHC (Cashmore & Taylor, 2017; Sen & Broadhurst, 2011). However, this result does not directly imply that relative/kinship care is more likely to improve the children's socio-emotional wellbeing than foster care, as we could not determine the causal relationship between the change in children's socio-emotional difficulties and the change in their placement type (e.g., foster care and relative/kinship care).

This study has revealed that compared to children in the non-clinical group, children who were persistently at a clinical level of socio-emotional difficulties were more likely to be males, subject to a high number of substantiated allegations of maltreatment (8 and above), have been placed in >3 placements, and in particular, had a caregiver with high levels of psychological distress. This finding points to the importance of providing socio-emotional assessment and support to caregivers. Such interventions may not only improve children's and caregiver's socio-emotional wellbeing, but also help enhance placement stability to the children, as caregiver's psychological distress can cause placement breakdown (Wulczyn & Chen, 2017). Further, previous research has indicated that adequate social support and training may improve caregivers' confidence and satisfaction, thereby moderating the relationship between perceptions of child behavioural problems and perceptions that fostering is challenging (Cooley, Thompson, & Newell, 2019; Goemans, Buisman, van Geel, & Vedder, 2020). It is possible that such support may similarly moderate the link between child's socio-emotional difficulties and caregiver stress.

We also want to acknowledge that the results include data collected from Aboriginal children and families. Interpretation of the data should consider the factors associated with the over-representation of Aboriginal children in child protection and OOHC including the legacy of past policies of forced removal and the intergenerational effects of previous forced separations from family and culture. This erosion of community and familial capacity over time needs to be considered in any reform efforts as it continues to have a profoundly adverse effect on child development. The implications for policy and practice should highlight strengths, develop Aboriginal-led solutions and ensure that better outcomes are achieved for Aboriginal people.

This study has several implications. It is important to assess the children's pre-care and in-care exposures associated with socio-emotional difficulties, such as the number of allegations of maltreatment and the type of maltreatment. Ongoing assessment of mental health needs of children is needed to assess mental health trajectories and ensure early and appropriate intervention is put into place. Adequate mental health support package that delivers targeted and practical interventions to the dyad of child and caregiver is essential. Most studies on interventions involving caregivers focussed on building positive parenting skills (e.g., building warm and nurturing caregiver-child relationship) and improving caregiver-child attachments (based on the attachment theory that emphasises the importance of having an emotionally sensitive and responsive caregiver). However, to our knowledge, there is little research on mental health interventions for caregivers and the interventions' effects on socio-emotional wellbeing of the children in care (Watt & Jakob, 2020). Such research is warranted in the future.

5. Strengths and limitations

This study has several strengths. The use of administrative data routinely collected by child protection agencies, such as age at entry to OOHC, history of pre-care maltreatment, and number and type of placements, helped reduce the potential impact of recall bias and missing data. Further, our study integrated pre-care and in-care system-related variables, which enabled us to have a more holistic understanding of the factors associated with socio-emotional difficulties. The longitudinal nature of the Pathways of Care Longitudinal Study (POCLS) interviews allowed us to use group-based trajectory modelling to explore different patterns of socio-emotional development of children in OOHC over time, among the sub-samples by age at entry into OOHC whereby the influence of age on

the children's socio-emotional development was reduced.

The main limitation of our study was the small sample size, as we focused on children older than 3 years of age to ensure the sample had all four waves of the CBCL assessment for the examination of socio-emotional outcomes. Therefore, the findings of this analysis are restricted to children who were ≥ 3 years of age at Wave 1 (i.e., baseline), over-representing children who were ≥ 3 years of age at entry into OOHC. These children may have more socio-emotional difficulties than children who are younger than 3 years at the entry to OOHC (McHugh et al., 2018). Additionally, this study sample included the large proportion of children subject to higher numbers of ROSH reports (e.g., ≥4 substantiated reports) and multiple types of abuse. This implies that children in the study sample may be more vulnerable to socio-emotional difficulties than the POCLS population cohort (described in Section 2.1.1). However, it remains difficult to infer how the trajectory groups derived from this study sample differ from the POCLS population cohort including all children who entered OOHC between 2010 and 2011, with no or incomplete socio-emotional assessments at all four Waves. The small sample size has also limited our capacity to have a better understanding of the characteristics of children in different trajectory groups. For example, our results show that children who predominantly experienced emotional abuse or sexual abuse were much more likely to have socio-emotional difficulties over time (i.e., the clinical trajectory) than those who predominantly experienced physical abuse. However, due to the small numbers of children in the sexual abuse and emotional abuse categories, studies with a larger sample size are warranted to validate these findings. Another limitation is that the CBCL can only be completed by parents/caregivers or teachers. Previous Australian research has shown a higher prevalence of self-reported mental health disorders by children and young people than that reported by their parents (Lawrence et al., 2016). This suggests that parents or caregivers may not always be aware of the mental health difficulties that young people are experiencing, leading to under-reported incidence. Further, we could not determine the causal relationship between the risk factors (e.g., placement type such as foster care versus relative/kinship care, caregiver stress and placement breakdown) and the socio-emotional trajectories, as no data were collected between Waves in the POCLS to determine the actual change in the socio-emotional outcome. Last, by the time this study was completed, the POCLS team was continuing the data collection which will inform the impact of the COVID-19 pandemic on the socio-emotional difficulties of children in OOHC. Considering the widespread impact of the pandemic on young people's mental health, future research is warranted to examine how the pandemic has influenced the socio-emotional outcomes of children in care.

6. Conclusion

Early intervention to ensure children have a nurturing care environment and psychological support to caregivers are vital for positive socio-emotional development over time among children in long-term OOHC. Long-term ongoing assessment and effective interventions delivered to both children in care and the caregivers are needed to improve the children's socio-emotional trajectories and long-term outcomes in their future.

Disclaimer

DCJ funds and leads the POCLS. The findings and views reported in this publication are those of the authors and may not reflect those of DCJ.

Contribution statement

All named authors have contributed substantially to this study and have approved the final form for publication. Study conceptualisation: RL, NH, and YAG; data analysis: YAG and NH; original draft preparation: YAG and NH; manuscript development: NH, YAG, and RL; visualisation: YAG; IK, EF, KF, MH, BN, JS, PH, and KZ critically reviewed the manuscript.

Ethical approval

The POCLS has been approved by the ethics committees, including the University of New South Wales Human Research Ethics Committee (HC10335, HC16542, HC210985), the Aboriginal Health & Medical Research Council (AH&MRC) of NSW Ethics Committee (766/10), the NSW Department of Education - State Education Research Applications Process (SERAP) (2012260), and the NSW Population & Health Services Research Ethics Committee - Cancer Institute New South Wales (HREC/14/CIPHS/74).

Data availability

The authors do not have permission to share data.

Acknowledgment

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chiabu.2023.106196.

References

Achenbach, T. M., & Ruffle, T. M. (2000). The Child Behavior Checklist and related forms for assessing behavioral/emotional problems and competencies. in review *The Journal of Pediatrics, 21*(8), 265–271. Retrieved from https://pedsinreview.aappublications.org/content/21/8/265.long.

AIHW. (2012). *Social and emotional wellbeing: Development of a Children's Headline Indicator. Cat. no. PHE 158*. Retrieved from Canberra.

Apos, H. A., Sebba, J., & Gardner, F. (2017). What are the factors associated with educational achievement for children in kinship or foster care: A systematic review. *Children and Youth Services Review, 79*, 198–220.

Australian Bureau of Statistics. (2017). *Personal Income in Australia: Key statistics for the 2011-12 to 2016-17 financial years*. Australia: ABS. Retrieved from https://www.abs.gov.au/statistics/labour/earnings-and-work-hours/personal-income-australia/latest-release.

Australian Institute of Health and Welfare. (2021). *Child protection Australia 2019–20. Child welfare series no. 74. Cat. no. CWS 78*. Retrieved from Canberra.

Brown, R., Alderson, H., Kaner, E., McGovern, R., & Lingam, R. (2019). "There are carers, and then there are carers who actually care"; conceptualizations of care among looked after children and care leavers, social workers and carers. *Child Abuse & Neglect, 92*, 219–229. https://doi.org/10.1016/j.chiabu.2019.03.018

Burke, S., & Paxman, M. (2008). *Children and young people from non-English speaking backgrounds in out-of-home care in NSW*. Retrieved from Sydney.

Cashmore, J. (2011). The link between child maltreatment and adolescent offending: Systems neglect of adolescents. *Family Matters*, (89), 31–41. Retrieved from https://search.informit.org/doi/10.3316/ielapa.716992028973761 https://search.informit.org/doi/full/10.3316/ielapa.716992028973761.

Cashmore, J., & Taylor, A. (2017). *Children's family relationships in out-of-home care: Pathways of care longitudinal study: Outcomes of children and young people in out-of-home care. (Research report number 9)*. Retrieved from Sydney.

Commission for Children and Young People. (2019). *In our own words, Systemic inquiry into the lived experience of children and young people in the Victorian out-of-home care system*. Retrieved from Melbourne Victoria.

Cooley, M. E., Thompson, H. M., & Newell, E. (2019). *Examining the influence of social support on the relationship between child behavior problems and foster parent satisfaction and challenges. Paper presented at the Child & Youth Care Forum*.

Evans, R., Brown, R., Rees, G., & Smith, P. (2017). Systematic review of educational interventions for looked-after children and young people: recommendations for intervention development and evaluation. *British Educational Research Journal, 43*(1), 68–94.

Fernandez. (2007). Unravelling emotional, behavioural and educational outcomes in a longitudinal study of children in foster-care. *The British Journal of Social Work, 38*(7), 1283–1301. https://doi.org/10.1093/bjsw/bcm028

Fernandez, E. (2006). Growing up in care: Resilience and care outcomes. In R. J. Flynn, P. M. Dudding, & J. G. Barber (Eds.), *Promoting resilience in child welfare* (pp. 131–156). Ottawa, ON: University of Ottawa Press.

Gartland, D., Riggs, E., Muyeen, S., Giallo, R., Afifi, T. O., MacMillan, H.Brown, S. J., … (2019). What factors are associated with resilient outcomes in children exposed to social adversity? A systematic review. *BMJ Open, 9*(4), Article e024870. https://doi.org/10.1136/bmjopen-2018-024870

Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *Lancet, 373*(9657), 68–81. https://doi.org/10.1016/S0140-6736(08)61706-7

Goemans, A., Buisman, R. S., van Geel, M., & Vedder, P. (2020). *Foster parent stress as key factor relating to foster children's mental health: A 1-year prospective longitudinal study. Paper presented at the Child & Youth Care Forum*.

Goemans, A., van Geel, M., van Beem, M., & Vedder, P. (2016). Developmental outcomes of foster children: A meta-analytic comparison with children from the general population and children at risk who remained at home. *Child Maltreatment, 21*(3), 198–217.

Goemans, A., van Geel, M., & Vedder, P. (2015). Over three decades of longitudinal research on the development of foster children: A meta-analysis. *Child Abuse & Neglect, 42*, 121–134.

Hallett, N., Garstang, J., & Taylor, J. (2021). Kinship care and child protection in high-income countries: A scoping review. *Trauma, Violence, & Abuse.* , Article 15248380211036073. https://doi.org/10.1177/15248380211036073

Hu, N., Taylor, C. L., Li, J., & Glauert, R. A. (2017). The impact of child maltreatment on the risk of deliberate self-harm among adolescents: a population-wide cohort study using linked administrative records. *Child Abuse & Neglect, 67*, 322–337. https://doi.org/10.1016/j.chiabu.2017.03.012

Johnson, G., Natalier, K., Liddiard, M., & Thoresen, S. (2011). *"Out in the world with no-one": A qualitative study of housing pathways of young people who have recently left state out-of-home care*. Australian Scholarly Publishing. Retrieved from North Melbourne.

Jones, B. L., & Nagin, D. S. (2013). A note on a Stata plugin for estimating group-based trajectory models. *Sociological Methods & Research, 42*(4), 608–613.

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., & Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry, 60*(2), 184–189. https://doi.org/10.1001/archpsyc.60.2.184

Landry, S. H., Smith, K. E., & Swank, P. R. (2006). Responsive parenting: Establishing early foundations for social, communication, and independent problem-solving skills. *Developmental Psychology, 42*(4), 627–642. https://doi.org/10.1037/0012-1649.42.4.627

Lawrence, D., Hafekost, J., Johnson, S. E., Saw, S., Buckingham, W. J., Sawyer, M. G.Zubrick, S. R., … (2016). In *, 50*(9). *Key findings from the second Australian Child and Adolescent Survey of Mental Health and Wellbeing* (pp. 876–886). https://doi.org/10.1177/0004867415617836

Lehmann, S., Havik, O. E., Havik, T., & Heiervang, E. R. (2013). Mental disorders in foster children: A study of prevalence, comorbidity and risk factors. *Child and Adolescent Psychiatry and Mental Health, 7*(1), 39. https://doi.org/10.1186/1753-2000-7-39

Li, F., & Godinet, M. T. (2014). The impact of repeated maltreatment on behavioral trajectories from early childhood to early adolescence. *Children and Youth Services Review, 36*, 22–29. https://doi.org/10.1016/j.childyouth.2013.10.014

McHugh, M., Blunden, H., & Katz, I. (2018). *Literature review: Factors influencing the outcomes of children and young people in out-of-home care. Pathways of care longitudinal study: Outcomes of children and young people in out-of-home care. Research report number 6*. Retrieved from Sydney.

Moore, S. E., Scott, J. G., Ferrari, A. J., Mills, R., Dunne, M. P., Erskine, H. E.Norman, R. E., … (2015). Burden attributable to child maltreatment in Australia. *Child Abuse & Neglect, 48*, 208–220. https://doi.org/10.1016/j.chiabu.2015.05.006

Nagin, D. (2005). *Group-based modeling of development*. Harvard University Press.

NSW Department of Communities and Justice. (2020). *Measuring child developmental outcomes: approaches and methods*. Retrieved from Sydney.

NSW Department of Communities and Justice. (2020). *Study design and data user guide. Pathways of care longitudinal study: Outcomes of children and young people in out-of-home care (Technical report number 2.)*. Retrieved from Sydney.

NSW Department of Communities and Justice. (2020). *Study design and data user guide. Pathways of care longitudinal study: Outcomes of children and young people in out-of-home care*. Retrieved from Sydney.

Pritchett, R., Gillberg, C., & Minnis, H. (2013). What do child characteristics contribute to outcomes from care: A PRISMA review. *Children and Youth Services Review, 35*(9), 1333–1341. https://doi.org/10.1016/j.childyouth.2013.05.001

Rayburn, A., Withers, M., & McWey, L. (2018). The importance of the caregiver and adolescent relationship for mental health outcomes among youth in foster care. *Journal of Family Violence, 33*(1), 43–52. https://doi.org/10.1007/s10896-017-9933-4

Royal College of Paediatrics and Child Health. (2020). Children in the child protection system. Retrieved from https://stateofchildhealth.rcpch.ac.uk/evidence/family-and-social-environment/child-protection-system/#:~:text=England%20experienced%20the%20greatest%20increase,47.7%20per%2010%2C000%20in%202018.

Sattler, K. M. P., & Font, S. A. (2018). Resilience in young children involved with child protective services. *Child Abuse & Neglect, 75*, 104–114. https://doi.org/10.1016/j.chiabu.2017.05.004

Sen, R., & Broadhurst, K. (2011). Contact between children in out-of-home placements and their family and friends networks: A research review. *Child & Family Social Work, 16*(3), 298–309.

Sonuga-Barke, E. J. S., Kennedy, M., Kumsta, R., Knights, N., Golm, D., Rutter, M.Kreppner, J., … (2017). Child-to-adult neurodevelopmental and mental health trajectories after early life deprivation: The young adult follow-up of the longitudinal English and Romanian Adoptees study. *Lancet, 389*(10078), 1539–1548. https://doi.org/10.1016/s0140-6736(17)30045-4

Fuller, T., Nieto, M., Wakita, S., Wang, S., Adams, K., Zhang, S., & Braun, M. (2017). Conditions of children in or at risk of foster care in Illinois: 2016 monitoring report of the B.H. Consent De Cree. Retrieved from Urbana https://cfrc.illinois.edu/pubs/rp_20171102_ConditionsofChildreninoratRiskofFosterCareinIllinois:2016MonitoringReportoftheB.H.ConsentDecree.pdf.

Tarren-Sweeney, M. (2008). The mental health of children in out-of-home care. *Current Opinion in Psychiatry, 21*(4), 345–349.

Tarren-Sweeney, M., & Goemans, A. (2019a). A narrative review of stability and change in the mental health of children who grow up in family-based out-of-home care. *Developmental Child Welfare, 1*(3), 273–294. https://doi.org/10.1177/2516103219874810

Tarren-Sweeney, M., & Goemans, A. (2019b). A narrative review of stability and change in the mental health of children who grow up in family-based out-of-home care. *Developmental Child Welfare, 1*(3), 273–294.

U.S. Department of Health &amp, Human Services. (2022). Child maltreatment 2020. Retrieved from https://www.acf.hhs.gov/cb/data-research/child-maltreatment.

Walsh, McHugh, M., Blunden, H., & Katz, I. (2018). *Literature review: Factors influencing the outcomes of children and young people in out-of-home care*. Retrieved from Melbourne Victoria.

Watt, E., & Jakob, L. (2020). *Interventions in out-of-home-care: An updated evidence and gap map*. Retrieved from Sydney.

Wells, R., Asif, N., Breen, C., & Zhou, A. (2020). *Influence of placement stability on developmental outcomes of children and young people in out-of-home care. 21*. Retrieved from.

Winokur, M. A., Holtan, A., & Batchelder, K. E. (2018). Systematic review of kinship care effects on safety, permanency, and well-being outcomes. *Research on Social Work Practice, 28*(1), 19–32.

Wulczyn, F., & Chen, L. (2017). *Placement changes among children and young people in out-of-home care. Pathways of care longitudinal study: Outcomes of children and young people in out-of-home care. Research report number 8*. Retrieved from Sydney.

Zou, G. (2004). A modified Poisson regression approach to prospective studies with binary data. *American Journal of Epidemiology, 159*(7), 702–706. https://doi.org/10.1093/aje/kwh090