The Effectiveness of Interventions Designed to Improve the Academic Outcomes of Children and Adolescents in Out-of-Home Care: A Systematic Review

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24th July 2015

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Abstract

Children and adolescents in out-of-home care face a complex set of barriers to learning that place them at serious educational disadvantage. Educational delays limit the future educational and employment prospects of this population leaving them vulnerable to a host of negative long-term outcomes. Longstanding concern for the poor academic status of children and adolescents in out-of-home care coupled with burgeoning interest amongst policymakers on how the academic outcomes of this population can be improved has lead to a proliferation of evaluative research studies in recent times. The objective of this systematic review was to locate, critically appraise and synthesise the best available evidence on the effects of interventions designed to improve the academic outcomes of children and adolescents in out-of-home care.

A search for published and grey literature was conducted across a range of electronic sources including ERIC; PsycINFO; PubMed; Social Services Abstracts; Sociological Abstracts, and Proquest Digital Dissertations. The search yielded 7263 unique records that were screened for eligibility. Studies were selected if they evaluated the impact of an intervention on the academic achievement of children and adolescents (<18 years of age) placed formerly or currently in out-of-home care using a randomised control trial study design. Following study selection and critical appraisal six eligible studies of moderate quality were included in the review. Study characteristics and methodological quality data were tabulated and accompanied by a narrative synthesis.

Two studies evaluated the effects of school readiness programs on the pre-academic skills of preschool aged children (three to five years) in foster and kinship care compared to 'services as usual' comparator. One school readiness program demonstrated a statistically significant impact on preschool children's early literacy, (ES = 0.26) while the other significantly improved children's pre-academic math and literacy skills (ES = 0.16) at post-intervention. Two studies evaluated the effects of a direct instruction tutoring program in primary school aged children (six to 13 years) in foster and kinship care using different delivery formats, compared to a wait-list control. At post-intervention, the one-on-one tutoring delivered by foster parents significantly improved children's math computation (ES = 0.46) and sentence comprehension skills (ES = 0.38) while the group-based tutoring delivered by university student volunteers significantly improved children's word reading

(ES = 0.40), spelling (ES = 0.25) and math computation skills (ES = 0.34). No evidence was found for interventions that aimed to improve the academic outcomes of high school aged adolescents (14 to 17 years) in the broader out-of-home care population at greater risk of educational failure.

In conclusion, evidence from this review suggests that multi-component interventions that target individual-level barriers to educational attainment can improve the short-term academic outcomes of young children in foster and kinship care; however, replication of these studies and more robust research is needed before firm conclusions can be made about the effectiveness of these programmes for improving the academic status of children and adolescents in out-of-home care. Implications for future research and policy and practice are discussed.

Declaration

I, Dagmara Riitano, certify that this work contains no material that has been accepted for the award of any other degree or diploma in any university or any other tertiary institution, and, to the best of my knowledge and belief, contains no material previously published or written by any other person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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July 2015

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Chapter 1 Introduction

1.1 Out-of-home care services in Australia

Young people in out-of-home care (OOHC) are amongst the most vulnerable groups in society today. They include infants, children and adolescents who have been removed from their family home due to concerns about their safety and wellbeing and placed into alternative forms of accommodation otherwise known as placement settings. In Australia, as in many other countries, the delivery of OOHC and child protection services is underpinned by principles that prioritise the 'best interests of the child' as outlined in the United Nations Convention on the Rights of the Child.[1,2] Despite this, the legislative, policy, regulatory and organisational frameworks that govern the provision of child protection and OOHC services vary considerably across countries and jurisdictions worldwide.[3] This thesis is situated within the Australian context and references current and typical OOHC practice within jurisdictions across Australia. Notwithstanding this, the international body of OOHC literature will be drawn upon to inform the research question posed by the present investigation.

The Australian Institute of Health and Welfare (AIHW) defines OOHC as "overnight care for children aged 0 to 17 years where the state or territory makes a financial payment".[1,p45] This definition does not commonly include children who are in placements "solely funded by disability, medical or psychiatric services, juvenile justice or detention facilities, overnight childcare services, supported accommodation assistance placements (i.e., homelessness), and children in placements with parents where the jurisdiction makes a financial payment".[1,p46] All Australian state and territory governments have a child protection department with statutory responsibility for ensuring that children within its jurisdiction are protected from harm caused by abuse and neglect.[4] Each child protection department is authorised to receive reports or 'notifications' of suspected child abuse and neglect. While all jurisdictions within Australia have laws mandating who is obligated to report concerns about a child's safety or wellbeing, notifications come from a range of sources including professionals (i.e., police, school personnel, medical practitioners, social workers etc.) members of the public and the children themselves.[1] If deemed appropriate, the child protection department will undertake an investigation to obtain more information

about a child who is suspected of being at risk of harm in order to assess the child's need for safety and protection.[4] The age of a child is one of the major factors that determines the time it takes for a child protection department to respond to a notification and the likelihood of a substantiation.[1] Most Australian jurisdictions have policies and procedures in place to prioritise the protection of the youngest children given their increased vulnerability to threats of harm.[1] Moreover, there has been increased emphasis nationally on the provision of services early in a child's life in response to mounting evidence that highlights the importance of early intervention to reduce the negative impact of trauma and maltreatment and promote positive long-term outcomes.[1, 5, 6] This is reflected in the most recent child protection data that demonstrates children are being admitted to OOHC at a younger age.[1] The AIHW reports that of the 11,341 children who entered OOHC during 2012–13, 4,839 (43 per cent) were under five years of age and almost one-quarter (24 per cent) were aged between five and nine years of age, while the median age of children admitted to OOHC was six years.[1]

If a child protection investigation substantiates (confirms) that a child has been, or is at serious risk of being abused, neglected or otherwise maltreated by those responsible for his or her care,[1] the child protection department has a key role in addressing the safety and protection of the child.[4] This can be achieved in a number of ways. For example, the child protection department can refer the family to engage voluntarily with family support or preservation services who provide treatment and support aimed at preventing family separation or child maltreatment[1] or a court order can be obtained to mandate the family to engage with specific support services (e.g., drug and alcohol services).[4] Currently in Australia, family preservation and maintenance is prioritised where possible.[4] Out-of-home care is considered a last resort intervention that is used when other approaches, such as family support and preservation services have been unsuccessful. If it is necessary to remove the child from the family home, a care or protection court order can be issued.[4] This approves some or all of the legal responsibility for the child to be transferred from the child's birth parents to the state or territory government and gives statutory authorities permission to remove the child from the family home and place them into alternative care arrangements.[4]

While the reasons children enter OOHC can vary, the vast majority of children in OOHC have been the subject of a child protection substantiation.[1] In 2012-13, the most common

type of substantiation in Australia was emotional abuse (38 per cent) followed by neglect (28 per cent);[1] other types of maltreatment include physical and sexual abuse, all of which can occur alone or in combination. Other reasons children are placed in OOHC include situations where parents were unable to adequately care for their child due to hospitalisation, dislocation or other temporal familial problems, conflicts or crises that cannot be addressed within the family.[1]

In Australia, like many other parts of the world, the total number of children living in OOHC is increasing.[3] The AIHW Child Protection 2012-13 report[1] found that between 2009 and 2013 there was a 19 per cent increase in the total number of children living in OOHC, rising from 34,069 at 30 June 2009 to 40,549 at 30 June 2013. This is reflected in the national rate of Australian children in OOHC, which has risen steadily from 2009 to 2013 – from 6.7 to 7.8 per 1,000 children.[1] Of the 40,549 children in OOHC at 30 June 2013, the vast majority (91 per cent) were on care and protection orders, just over half (52 per cent) were boys, and almost a third were aged five to nine (32 per cent) or 10 to 14 (31 per cent). Indigenous children continue to be over-represented in OOHC with a national rate 10.6 times higher than the rate for non-Indigenous children.[1] The number of children in substantiated abuse and neglect cases also rose by 29 per cent between 2010-11 and 2012-13, a reversal of the downtrend that was observed between 2008-09 and 2010-11.[1] Most children (42 per cent) who were the subject of a substantiation were from areas with the lowest socioeconomic status.[1]

1.1.1 Placement settings

Out-of-home care encompasses various types of living arrangements, otherwise known as placement settings. The main types of placement settings fall under the categories of home-based care and facility-based care.[1] Placements vary in duration and can include: emergency/crisis, short-term, long-term and permanent care. When a child needs to be removed from the family home they are placed, where possible, for a period of time in a care setting that best meets their individual circumstances and developmental needs. For example, Aboriginal and Torres Strait Island children in Australia are typically placed within the child's community or family network to adhere with the Aboriginal Child Placement Principle.[1]

1.1.1.1   Home-based care

Home-based care is by far the most common type of OOHC placement.[1] At 30 June 2013, 93 per cent of all OOHC children were living in home-based care (43 per cent in foster care, 48 per cent in relative/kinship care and 3 per cent in other types of home-based care).[1] Children placed in home-based care live in the home of a caregiver who is offered support and financial assistance for expenses associated with caring for the child, typically until the child's 18th birthday.[7] The main types of home-based care include foster care, and relative or kinship care. Children in foster care are placed with a non-relative carer who is authorised by community services or an accredited OOHC agency to provide safe and nurturing care for the child in a family environment for a variable period of time.[8] Children in kinship or relative care are placed with a carer who is a family member (other than the child's parents) or with an individual who has a pre-existing, established relationship with the child such as a close family friend or a member of the child's community.[1]

1.1.1.2   Facility-based care

Children placed in facility-based care reside in a community-based, family-like residential home, often with a small number of other similarly placed children and paid staff who are employed to care of the children.[7] Common types of facility-based care are known as family group homes, or community residential or congregate care. These types of care commonly include facilities where staff provide either live-in, full-time care (family group homes) or staff who work rostered shifts to provide continual care (residential accommodation).[7] Facility-based accommodation is typically reserved for young people who for any number of reasons cannot be placed into home-based care (i.e., foster or kinship care)[8] such as children with highly challenging, complex or specialised needs (e.g., more severe psychological or behavioural issues) who may be at risk of hurting themselves and others, and consequently require more intensive support and supervision than foster care or other less restrictive environments can provide.[1, 9]

1.1.2   Young people leaving OOHC

For the majority of children and adolescents in OOHC, Australian state and territory governments take on the parenting or guardianship role for the child in place of competent parents.[5] A range of organisations and individuals collectively share the responsibility for

the safety, welfare and healthy development of children and adolescents in OOHC until they reach the age of majority - typically their 18th birthday.[1] Once the young person reaches adulthood, they are recognised by law as having sufficient capacity to make decisions for themselves. Consequently, responsibility for the young person by government agencies, including the provision of case management services and financial support for the young person's out-of-home placement, ceases to continue. The young person *emancipate*s or *ages out* of care and commonly transitions into independent living. Some young adults may continue to receive financial assistance or transitional services past this age if they meet certain requisite criteria.

Young people emancipating from OOHC face many more challenges than their peers in the general population. Research has found that young adults moving from OOHC into independent living often do so prematurely without the support of friends and family, sufficient financial resources or adequate life skills.[10-12] Once out of the care system, former OOHC youth are more likely to experience substance abuse,[13] housing instability,[12] homelessness,[11, 14] unemployment,[14, 15] poverty,[11] single parenthood,[12] mental health difficulties[16] and are more likely to become involved with the welfare and criminal justice system than their peers in the general population.[12, 16]

Although child welfare and protection agencies have an obligation and a responsibility to safeguard and adequately prepare young people in their care to lead self-sustaining and productive lives, multiple research studies indicate that the vast majority of young people leaving care are ill equipped to make a successful transition into adulthood.[10, 15, 17, 18] In light of this, ways in which young people in OOHC can be better supported and equipped to live independently after leaving care has increasingly come under the scrutiny and attention of policymakers, practitioners and researchers alike. To date, the provision and development of therapeutic services and frameworks that seek to minimise the adverse impact of maltreatment and trauma on children's psychological wellbeing has been the focus of most strategies aimed at helping to meet the future needs of children in OOHC.[19] This focus is reflected in the evidence-base, which is replete with research documenting the psychological sequelae and behavioural functioning of children and youth in OOHC (for a review see Jones et al[20]) Considerably less attention has been directed toward understanding and improving the academic and school outcomes of children in OOHC both in the research literature[19, 21] and within practice settings.[22]

Notwithstanding this, there has been increasing awareness and heightened concern internationally over the last couple of decades that young people in OOHC are not achieving adequate levels of education and are transitioning out of care without the fundamental knowledge and skills required for gaining meaningful employment and maintaining self-sufficiency.[23] A growing body of research has consistently demonstrated that young people in OOHC are at a serious disadvantage across multiple indicators of educational success[19, 23, 24] and face a complex and interrelated set of barriers to educational attainment that place them at high risk for a range of poor long-term outcomes.[5, 22, 25, 26]

1.2 Educational outcomes of children and adolescents in OOHC

1.2.1 Academic performance

Both in Australia and internationally, research consistently shows that young people in OOHC do not do well in school and perform significantly below their peers in the general population across a range of academic indices.[5, 12, 19, 22] A literature review examining the educational status and school functioning of the OOHC population in the United States found that children placed in OOHC displayed numerous difficulties across various academic disciplines including reading, mathematics, writing, spelling, social studies, science and language, irrespective of their placement setting.[19] The review of 29 studies revealed that overall, OOHC students performed in the *low to average* range on standardised tests and academic achievement measures (e.g., Woodcock-Johnson Test of Achievement; California Achievement Test), in the *low to low-average* range on percentile scores; and in the *low-average* range on measures of intelligence.[19] Out-of-home care students were also more likely to obtain lower individual school grades (within the B to C range) and an overall lower grade point average (GPA) than children in the general population.[19]

These findings are consistent with other research studies that have found OOHC children typically perform worse than their peers in the general population on academic measures of reading[27] spelling, numeracy and mathematics.[5] An exploratory study by Townsend[5] investigating the educational engagement and achievement of young people in care in New South Wales, Australia, found that academic outcomes for children in OOHC were

significantly worse than for other children in the state at every level of literacy and numeracy testing for the two years during which they were examined. Notably, the study found that children in care performed most poorly in numeracy. Between 15 and 25 per cent of children in OOHC did not meet the numeracy benchmarks in the early years of schooling and continued to struggle with numeracy throughout their primary and secondary schooling.[5] The finding that numeracy and mathematic skills are particularly challenging for many children in OOHC has been corroborated by previous research.[19, 28]

1.2.1.1 Grade performance and repetition

Children in OOHC have been found to commonly perform one to two years behind their grade level.[27, 29] The first longitudinal study to examine the educational status of children in OOHC found that over half of the foster care sample performed below grade level and one third were behind in reading ability by approximately two years.[27] A more recent study by Bruhn et al, cited in Hartnett et al[29] found that 71 per cent of the OOHC children sampled performed below grade level on state tests of mathematics and 67 per cent were below grade level in reading ability. In light of their poor school performance, it is not surprising that OOHC students are more likely to repeat a grade at school. A study by Flynn and Biro[30] found that 41 per cent of students cared for by a Canadian child welfare agency had repeated a grade in school compared with only 9 per cent of children from a nationally representative sample of the general population.

Research indicates that children perform below grade level upon entering OOHC and continue to remain behind grade level or decline even further academically during their time in OOHC.[5, 31, 32] For example, Miller et al, cited in Flynn et al[33] found that the number of young people in OOHC who had repeated a grade increased with age; in their study, 16 per cent of OOHC children aged five to nine had repeated a grade compared with 27 per cent of 10 to 15 year olds and 32 per cent of those aged between 16 and 20 years. Similarly, the study by Townsend[5] revealed that children's numeracy and literacy performance declined during the course of their schooling. By the time OOHC students reached Grade 7 (12 to 13 year-olds in NSW, Australia), 70 per cent lacked numeracy proficiency and almost 40 per cent lacked literacy proficiency.[5] Such findings indicate that the supports and services within the educational and child welfare system do not adequately address or remediate the academic needs of children during their time in OOHC.[5]

1.2.1.2   Special education placement

Research also indicates that a disproportionately high number of young people in OOHC are placed in special education programmes that cater learning to students with exceptional needs. A study by Scherr[34] meta-analysed data from 31 studies conducted across multiple countries to examine the educational status of children living in foster homes internationally. The results indicated that almost one third of foster children qualified for or were in receipt of special education services. Furthermore these children were approximately five times more likely than non-fostered peers to be identified as needing special education assistance. Notably, the study found that between 1980 and 2000, the number of foster children who qualified for special education rose substantially from 18 to approximately 36 per cent.[34] While it is possible that many young people in OOHC are suitable candidates for special education assistance, some study authors suggest that special education is not an appropriate remediation model for this population.[32, 34]

1.2.2   School graduation and dropout rates

1.2.2.1   High school graduation and dropout rates

As Townsend et al[5] highlighted, academic difficulties experienced during the early years of schooling are likely to adversely impact on the educational attainment and the retention of young people in their senior years of schooling. This assertion is supported by research that has found young people in OOHC are far less likely to graduate from school and have higher school dropout rates than youth not placed in OOHC.[5, 18] A longitudinal study conducted in the United States that followed three different age cohorts of students in permanent OOHC placements between 1998 and 2003, found that 32 per cent of foster care teenagers graduated from public school compared to 59 per cent of their peers, and 50 per cent or more OOHC students dropped out of school in each cohort, a proportion far greater than that for their public school peers.[32] The disproportionately large dropout rates between OOHC students and those not in OOHC have been replicated by a more recent three-year longitudinal study conducted in Canada.[12] The Promoting Positive Outcomes for Youth project found that over 50 per cent of youth emancipating from OOHC had not graduated from high school compared to just 25 per cent of students from the general population.[12]

1.2.2.2 Post-secondary education and graduation rates

Not surprisingly, early academic deficits continue to impact upon post-secondary education with research indicating that former OOHC students are less likely to attend or graduate from a University degree, community college or a skilled trade programme than their peers in the general population.[11, 22, 35] A study by Pecora et al[11] involving a cohort of 659 foster youth found that while many youth reported high educational aspirations before leaving care, only 2.7 per cent obtained a bachelor's degree compared to 24 per cent of young people in a similar age range from the general population. This equated to one in 50 former foster youth recipients having achieved a bachelor's or higher degree.[11] The YiPPEE project, a large-scale study conducted across five European countries (England, Denmark, Sweden, Hungary and Spain) and designed to investigate higher educational pathways for youth in former OOHC, found that around eight per cent of young people formerly in OOHC accessed higher education, which was approximately five times less than young people overall.[22] Boys seem to be at a greater disadvantage than girls in attaining a higher degree qualification. Using data from a state-wide sample of youth in foster care in the United States, a recent study by Kirk et al[36] found that females emerging from the foster care system were more than twice as likely to achieve a bachelor's or graduate degree than boys.

1.3 Barriers to educational attainment

There are many reasons why children in OOHC struggle to do well in school. Existing research has found that children in OOHC face a complex but common set of barriers to educational attainment.[5, 22, 23] Qualitative data derived from the YiPPEE project found a high measure of consensus on what facilitates and impedes OOHC youth's progression to higher education in spite of the difference in legislative service system frameworks operating in each of the countries that were investigated.[22] The study categorised factors that impacted on OOHC student's educational attainment as occurring on four distinct but interrelated levels: the individual-level; family- and caregiving-level; institutional- or system-level; and policy- and legislative-level.[22] This thesis will outline barriers that occur at the individual-, caregiver- and system-level, as these are most likely to be addressed by intervention research studies within this field. Individual-level barriers to educational success refer to those challenges that arise from within the individual (i.e., personality,

motivation, degree of resilience etc.) and reflect common characteristics and attributes of the OOHC population;[22, 37] caregiver-level barriers are difficulties that relate to the various professionals and carers involved in the provision of care and educational services to young people in OOHC (e.g., caregivers, teachers, social workers, mentors, residential care staff etc.);[5, 22] and finally, system-level barriers refer to the external influences that impact upon a young person's level of educational attainment and encompass the local and community service agencies that deliver government policies and legislation as well as and the relationships that exist between them.[22, 37] System-level agencies include child welfare departments, schools, voluntary bodies, and charity and youth organisations.

Although many of these factors may function independently to hinder educational progress in the OOHC population it is also widely recognised that they are multidimensional and interrelated, and collectively compound this population's educational disadvantage and vulnerability to academic failure. The following section outlines some of the most commonly cited barriers to educational advancement for young people in OOHC.

1.3.1 Individual-level barriers to educational attainment

1.3.1.1 Developmental and cognitive delay

Young people in OOHC have, by definition, been subject to traumatic experiences. Children entering OOHC have typically suffered trauma as a result of pre-care experiences of abuse, neglect, dysfunction or disruption in the family home as well as the trauma associated with being removed and separated from their birth parents and extended families. Unfortunately, some children experience further trauma as a result of the treatment they receive in care, such as the occurrence of multiple placement breakdowns or transitions.[38]

A large body of research exists that indicates traumatic experiences such as abuse and neglect have a profoundly negative affect on a range of children's short and long-term outcomes, including their educational attainment.[39, 40] Multiple research studies have found that even after controlling for other risk factors associated with poor school performance such as low socioeconomic status, a history of child maltreatment is independently related to lower standardised test scores and school grades, and higher rates of grade retention, school absenteeism, disciplinary action at school and special education admission.[30, 41-45] Such findings are supported by qualitative data obtained from

former recipients of OOHC from across each of the five countries surveyed in the YiPPEE project who reported that pre-care experiences of abuse within their birth families were a major barrier to their educational success and progression.[22]

Numerous studies posit that the normal development of children in OOHC has often been severely disrupted by trauma stemming from abuse, neglect and out-of-home placement, causing many to suffer from various developmental delays and deficits across multiple domains of functioning (i.e., health and physical development; intellectual and cognitive development; emotional and psychological development; and social and behavioural development) that impede children's capacity to learn and engage with school programmes effectively (for a review see Romano et al[40]). For example, Pears et al[46] found that compared to a sample of same-aged, non-maltreated children with similar socio-economic backgrounds, preschool aged children in foster care (aged three to six years) demonstrated developmental deficits on measures of height, head circumference and visuo-spatial, language and general cognitive functioning. Similarly Crozier et al[47] found that maltreated OOHC adolescents scored below the national mean on standardised tests of cognitive functioning and academic achievement. Children in OOHC also commonly experience speech, language and learning delays that can make educational attainment difficult.[48, 49]

1.3.1.2   Emotional and psychological development

Not surprisingly, a history of maltreatment and trauma adversely impacts on children's emotional and psychological development. Multiple research studies demonstrate that children in OOHC have disproportionally high rates of emotional and behavioural disorders[50] and are more likely to be classified as emotionally disturbed than their peers in the general population.[51, 52] For example, young people in OOHC have been found to be more depressed, more anxious and more likely to lose behavioural and emotional control than their general population peers.[24] A United States study involving a sample of 373 foster care youth found that 61 per cent of foster youth met the DSM-IV criteria for at least one psychiatric disorder during the course of their life and 37 per cent of youth met the criteria for a psychiatric diagnosis in the preceding year.[53]

1.3.1.3   Social and behavioural issues

Cognitive delays and psychological problems commonly interrelate and often manifest into

a range of maladaptive social and behavioural problems. Research has found that a significant proportion of children in OOHC who have been classified as emotionally disturbed tend to display more serious behavioural problems at school than their non-OOHC peers.[30, 32, 34, 54] A study by Zima et al[55] found that 27 per cent of six to 12 year old foster children scored within the clinical range for behavioural problems and 34 per cent had at least one behavioural problem in the school classroom. Other studies have reported much higher rates of borderline and clinically significant behavioural problems among samples of OOHC children as measured by the Child Behavior Check List (CBCL).[56-58]

Out-of-home care students classified as having behavioural issues are less likely to do well in school. For example, Trout et al[59] found that 91 per cent of OOHC students classified with emotional and behavioural disturbances performed below grade level and none performed better than grade or age level. The challenging behaviours many OOHC children exhibit (i.e., significant externalising and internalising symptoms) can hinder teacher's capacity to provide effective instruction and can prevent them from engaging effectively with their school work and their learning environment.[55, 60, 61]

1.3.1.4   Disciplinary actions

Challenging behaviours typically lead young people in OOHC to be the subject of disciplinary actions within the school setting. Research indicates that young people in OOHC receive higher rates of disciplinary referrals[34] (a form submitted by school personnel that refers a child for further disciplinary action beyond that which could be delivered by the teachers themselves) and are more likely to be suspended and expelled from school than their peers.[42, 43, 52, 54, 55, 62] An analysis of discipline rates in the meta-analysis by Scherr[34] found that 24 per cent of OOHC students from a combined sample size of 3,646 children from across 10 studies had been suspended or expelled from school at least once. The severity of maladaptive behaviours is positively correlated with suspension and expulsion rates.[55] Consequently, children who have clinically significant behaviours are more likely to be been suspended or expelled from school[56] and in turn are more likely to miss out on much needed educational instruction.

1.3.2 Caregiver- and system-level barriers to educational attainment

While a history of trauma and the ensuing developmental delays and deficits that impact on children's educational attainment may help to explain some of the poor school performance demonstrated by children in care, there is a high level of consensus amongst scholars, professionals, caregivers and children in OOHC that the lack of support and priority given to children's education among individuals and agencies responsible for children and youth in OOHC substantially impedes their ability to succeed academically and is a major impediment to their educational progress.[5, 23] For example, a study by Montserrat et al[63] found that delays in educational progress were frequent even among young OOHC students who were highly motivated and demonstrated academic promise.

1.3.2.1 Lack of family and caregiver support

There is a widely held assumption that young people in OOHC have an impaired capacity to succeed academically. Research highlights that low expectations amongst caregivers, social workers and teachers of OOHC student's academic ability can act as a barrier to their academic achievement.[23] Moreover, caregiver's and social worker's pessimistic expectations of OOHC students ability to achieve unfortunately means that many of these children often do not receive the support they need to learn and develop academically.[22, 23, 64] For example, the care environment may not be equipped with an appropriate study area or may lack books or other educational resources that facilitate learning.[65] Researchers have posited that the level of a caregiver's and social worker's interest and commitment to a child's education can serve to function as an important factor and key determinant of the academic success that children in OOHC obtain.[22] Within the qualitative literature, children in OOHC have repeatedly expressed that acknowledgement and support for their academic progress by caregivers, teachers and social workers largely accounted for their positive experience with education.[22, 66]

1.3.2.2 School and placement mobility

Many young people in OOHC experience placement instability and commonly change placement settings multiple times during their time in OOHC. In a study by Needell et al[67] approximately one third of a large sample of foster children (N = 12,306) changed placement settings at least five or more times.[67] Similar findings were reported by Courtney et al[17] who found that foster youth had, on average, experienced between four

to six OOHC placement settings during their time in OOHC.

Frequent placement changes cause significant disruption to a young person's life and their schooling.[32, 68] Many OOHC students are commonly denied the opportunity to continue attending the same school following a placement change[23] and consequently move from school to school with each placement transition.[19, 69] Sullivan et al[61] undertook a study to examine the effect of school change on academic progress and behavioural problems by interviewing 159 youth retrospectively about their educational experiences while in foster care. Youth in the study reported that on average they experienced 7.35 placement changes and 8.26 school transfers during their average 6.6 years in OOHC.[61]

A growing body of research has consistently found that placement mobility particularly when accompanied by a change in school negatively impacts on the school engagement and academic achievement of young people in OOHC[60, 61, 68-71] and is a key mediator of impeding educational progress.[60, 72] For example, children who move from one school to another often spend extended time away from the school environment, which causes a disruption in the provision of educational instruction that can hinder academic progress and widen already present educational gaps.[31] Furthermore, when moving to a new school, children and adolescents in OOHC - a large proportion of whom suffer from emotional, social and behavioural problems - must learn to adapt to a new school environment including a new curriculum, new expectations, educational programs[69] and a new social setting, which can be a stressful experience for many of them.[61] Frequent disruptions can have a negative impact on the development of social relationships and can make OOHC students reluctant to commit to the educational programs provided to them.[61] Placement and school mobility has also been found to exacerbate developmental delays and behavioural difficulties[61] and is associated with an increase in absenteeism, which is negatively related with academic achievement and school success.[68, 72]

1.3.2.3   Poor interagency collaboration

Various government agencies and a wide range of professionals are responsible for the care and wellbeing of a young person in OOHC with each organisation typically taking responsibility for a different facet of care. For example, schools are responsible for the child's education, government social or child welfare workers commonly oversee the child's health and legal matters, and charity organisations may be contracted to take care of

children's placement needs. As different agencies commonly operate in silos, serving to only meet the child's need for which they are responsible, a number of research studies have highlighted the lack of interagency collaboration and cooperation as a significant impediment to the education progress of children in OOHC.[25, 70, 73] In the United States, a multi-county exploratory study examining the provision of educational services to youth in foster care revealed that poor interagency communication was a systemic barrier to foster youth's educational advancement.[70] School and child welfare agency personnel commonly differed in their perspectives of the student's school needs and the part each organisation played in addressing them.[70]

Changing the school a child attends entails many administrative and logistical arrangements that require an organised and coordinated effort if they are to prevent serious disruption for students in OOHC. Poor communication between agencies when a child is transferred from one school to another can result in the loss or mismanagement of school records that typically contain important information about the student's academic status, behaviour, school attendance, special education placement, and educational needs; information school personnel require to ensure children receive educational programmes and services appropriate to their individual needs.[23]

Research has found that OOHC students who change schools are more likely to fall behind academically because school records are either lost or not shared between schools in a timely manner and critical information for young people in OOHC is not followed-up or shared between agencies.[32, 71, 74] Moreover, existing studies reveal many school records are inaccurate, often lack important information about the child, and are difficult to access precluding the appropriate administration of educational programs and services by school personnel to the child in need.[23, 71] Student's educational success can be jeopardised as agency case-workers who typically advocate for children when they change schools commonly do so without important information. For example, in the United States, welfare agencies are currently unable to gain access to student records without a court order. The legal process slows down the transfer of records as students move from one school to another and minimises opportunity for social workers to intervene when a child struggles academically.[75] A study investigating the ease of accessibility to school records of highly mobile foster youth found that it took between three weeks to eight months to locate school records and often social workers and their case files had inaccurate information on the

school being attended by their OOHC client.[71] Out-of-home care students with serious educational or behavioural problems and those with frequent school changes were more likely to have records that were inaccurate and incomplete, or records that were missing or had not been sent to the new school.[71]

Due to a lack of coordination between schools and child welfare organisations, many OOHC students who require specialised educational assistance are often overlooked whilst others who display temporary behavioural problems due to placement changes are unnecessarily placed in special education programs.[19, 23] To further compound the problem of multiple school changes, research also suggests that consideration is seldom given to the timing or frequency of school transfer for children in OOHC. School transfers commonly occur at important times within the school year such as near the beginning or end of term meaning many OOHC students miss significant portions of the school year and can experience difficulty with re-enrolment.[23]

1.3.3 Current state of research and policy directives

Research indicates that a complete formal education is a predictor of positive outcomes for children in OOHC[15] and has been identified by young people in OOHC and their carers as being one of the most important determinants of a successful transition into independent living.[76] In light of the poor long-term outcomes associated with low levels of educational attainment, the educational advancement of children in OOHC has become a key issue for policy makers, child welfare advocates and research organisations in more recent times.[26] A range of policy initiatives and legislative changes designed to address the educational disadvantage faced by a growing number of at-risk students have been implemented across multiple jurisdictions worldwide.[77] In accordance with new legislation that calls for stricter educational standards and greater public accountability measures, systems and services responsible for children's educational attainment are increasingly being assessed on their performance in meeting the educational needs of underachieving students.[78]

In response, there has been burgeoning interest amongst decision makers, educators and other relevant stakeholders on the types of interventions that can effectively improve the academic and school performance of at-risk children, particularly those in OOHC who commonly represent the most educationally disadvantaged of all population groups. Unfortunately, despite the concern and overwhelming consensus that children in OOHC

are at serious educational disadvantage, research assessing the effects of interventions on the educational outcomes of children in OOHC has been scant; however, there has been a proliferation of evaluative studies conducted in recent times within this emerging research field.[19]

1.4   Interventions targeting educational attainment

A diverse range of interventions designed to improve the educational attainment and school outcomes of children in OOHC exist.[79, 80] Interventions designed to improve educational outcomes are heterogeneous by nature and often vary in their composition across multiple dimensions.[81] For example, interventions can differ with regards to the educational philosophy or theoretical model on which they are based. The chosen conceptual framework can influence the focus of the intervention and can lead to the inclusion of components and content that specifically target certain vulnerabilities or risk factors that have been found to mediate or moderate academic performance within the sampled population. Educational interventions can also vary in how they are delivered.[81] This can include variation in the type of instructor delivering the content and the duration and intensity of the intervention programme. The content and instruction can be tailored to meet the specific needs of the student and delivered in an individualised way (one-on-one) or within a group session format. Furthermore, educational interventions can be delivered in various settings such as in a classroom-based environment or within the recipient's home and can be designed to target different populations and groups of students. Given the heterogeneity of the OOHC population, different programmes specifically cater the intervention to the needs of the child's age, cognitive capacities and other individual differences that may impact on the outcomes being investigated (emotional and behavioural issues, placement settings etc.).[81] The following section will provide an overview of the types of interventions that have been conducted involving the OOHC population.

1.4.1   Individual-level interventions

Individual-level interventions target barriers to educational attainment occurring at the intrapersonal level such as specific characteristics and vulnerabilities that are common to children in OOHC (see Section 1.3.1). Many of these interventions focus on compensating or remediating academic gaps in underachieving students such as below average

numeracy and literacy skills that have developed in children due to a lack of stimulation or skill development as a result of adverse pre-care experiences (i.e., neglect), or gaps in instruction as a result of school and placement changes, which have lead them to fall behind academically.[80] Many of these interventions utilise an individualised or tailored approach to instruction or coaching that also targets specific vulnerabilities of the population such as seeking to improve psychological or behavioural issues that can impede children's capacity to engage with the academic content or the learning environment in a positive way.[77] Such programmes assume that if young people in care receive sufficient educational support and assistance through specialised and individualised training they can reach their educational potential or the educational levels of their peers.[77, 80]

1.4.1.1   Tutoring

Tutoring is a popular intervention that is used to deliver targeted educational support. Tutoring is an established model and there is evidence supporting its effectiveness in improving the academic outcomes of young children at-risk of educational failure[82] and children in the general population.[83] Tutoring programs aim to improve academic performance but can facilitate a mentoring relationship between the tutor and tutee and improve behavioural or psychological outcomes. Tutoring programmes have the most empirical support for improving the academic outcomes of children in OOHC.[80] While they have been found to improve the academic achievement of students in OOHC, the academic skills that are targeted often vary across programmes, with significant improvements reported for reading[84-87] sentence completion, spelling,[86-88] and mathematics[33, 88]

Tutoring interventions are flexible in how they are delivered and can be delivered on an individualised, one-on-one basis or in a group format. Individualised tutoring has been favoured for use with at-risk populations as it allows more tailored instruction to be delivered to young people who may struggle to stay focused or engaged in a group setting. Individuals with varying levels of teaching experience can deliver tutoring interventions. Teacher volunteers[87] foster parents[33], university or college students[88, 89] have all been employed to act as tutors for OOHC students.

1.4.1.2 Distribution of learning materials

Some interventions seek to facilitate learning and improved academic attainment through the distribution of educational materials to children in care. One of the best-known initiatives aimed at facilitating educational engagement and improved educational outcomes in the OOHC population through material distribution is the Letterbox Club[90] in the United Kingdom. The intervention provides reading, writing and mathematics materials as well as books, stationery items and educational games to children in care in order to improve their educational achievement. The evaluation of the Letterbox Club in 2007 and 2008 revealed that children showed significant improvements in reading across both years, and in mathematics in one of the years the investigation was conducted.[91] A study by Wolfendale et al[92] similarly implemented a material distribution intervention to young people in OOHC. Over the course of the 15-month intervention, children were supplied with books and a handheld computer. Project workers visited on a monthly basis to monitor progress and to identify and resolve any difficulties that were encountered. Participating young people in OOHC showed statistically significant improvements in literacy skills.[92]

1.4.2 Caregiver- and system-level interventions

A number of interventions seek to improve the educational outcomes of young people in OOHC by targeting the barriers to their educational attainment that occur at the caregiver- or system-level (see Section 1.3.2). These types of interventions target system failings or deficits in educational support provided by individuals and organisations responsible for the welfare and development of children in OOHC. More specifically they seek to improve communication, collaboration and coordination between the sectors and individuals whose involvement has an impact on a child's educational outcomes. A number of interventions have focused on improving the educational outcomes of students in OOHC by improving the partnership and collaboration between educational and social welfare services and the policies and practices that operate within these departments.

An intervention investigated by Zetlin et al[93] that featured in previously published syntheses,[79, 80] used an education liaison officer to act as an intermediary between the child welfare and education system to resolve children's educational issues did not have a significant impact on children's educational outcomes. The systematic review by Liabo et al[79] identified two other system-level interventions that demonstrated an improvement in

collaboration between departments however did not translate to improved educational outcomes for children in receipt of these services. Both interventions employed a single person to improve the education of children in OOHC by working locally in collaboration across various departments in order to achieve this.[94, 95]

1.5   Significance of this review

There is increasingly strong demand for information on what works in improving the poor educational status of children in OOHC amongst a range of stakeholders. Accordingly, a synthesis of the extant literature on the effects of interventions aimed at improving the academic outcomes for this population can help to elucidate potentially promising programmes that could assist to remediate or improve the deficits in academic achievement so commonly experienced by this population. Findings and recommendations stemming from this review could also help to identify gaps in the research literature, which could help to inform and guide practice and policy initiatives within this emerging field.

To the best of the author's knowledge, only two syntheses similar to this topic have been conducted to date. A preliminary search of the literature base uncovered a scoping review examining interventions aimed at improving school achievements of children in OOHC.[80] The review sought to analyse interventions aimed at improving foster children's academic achievements measured using grades, age standardised measurements and subjective teacher assessments. The review, published in 2012, included 11 studies from the preceding 35 years that included foster care children between six and 15 years.[80]

Additionally, a systematic review of interventions designed to support OOHC children in school was identified after the commencement of the present review and publication of the *a priori* protocol (see Appendix 1).[96] The systematic review by Liabo et al[79] evaluated interventions that sought to improve the academic achievement or school dropout, exclusion and absenteeism rates of children living in OOHC. This review also included 11 studies with a specific focus on students who were between 10 and 15 years of age in mainstream school settings.[79] Both reviews identified a number of interventions that had a positive impact on children's educational outcomes, however concluded that the validity of the findings was undermined by the poor quality across the range of included studies (i.e., observational and randomised control study designs).[79, 80] Although both reviews ultimately included the same number of studies there is little overlap in the studies

selected.

The current review seeks to build on the existing reviews[79, 80] already undertaken in this field and differs in a number of ways. First, unlike the existing reviews,[79, 80] the present review expanded its eligibility criteria to include studies that involved OOHC children across all eligible age groups (i.e., <18 years of age). In doing so, the present review sought to capture interventions that targeted OOHC children at the beginning of their educational development (i.e., preschool years) as well as OOHC adolescents preparing to leave the care system. Information on interventions that could improve the educational outcomes of children at each end of the school age spectrum has potential utility and relevance for decision makers given the prioritization afforded to young children and early intervention initiatives in the child welfare system and the difficulties that adolescents emancipating from OOHC face with regards to securing positive educational and employment opportunities. Second, the present review will build on the findings from the Forsman et al[80] study by assessing the methodological quality of eligible studies using a standardised critical appraisal tool and presenting the findings in light of the limitations and biases in each study. Third, unlike the review by Liabo et al[79] the present review only included studies that reported on academic outcomes; school performance was defined as a secondary outcome that would only be extracted it if was incidentally reported by the included study. Moreover, unlike the existing reviews,[79, 80] the present review only included studies that utilised a randomised controlled trial (RCT) design as it provides the best source of evidence for questions concerned with determining the effectiveness of an intervention.[97-99]

1.6 Review question and objective

The objective of this review was to locate, critically appraise and synthesize the best available evidence on the effectiveness of interventions designed to improve the academic outcomes of children and adolescents in OOHC with a view to informing further research, policy and practice in the field. The specific question guiding this review was:

- What is the best available evidence regarding the effectiveness of interventions designed to improve the academic outcomes of children and adolescents in out-of-home care?

1.7 Methodology overview

A systematic review seeks to provide an exhaustive and unbiased summary of the best available evidence by synthesising the results of multiple individual studies to answer a particular research topic or question.[100, 101] The findings and conclusions from systematic reviews are considered to hold greater validity than those arising from traditional literature reviews as they are based on rigorous methods that aim to minimise the risk of error and bias throughout the review process.[102] The systematic review process achieves rigour through explicit and comprehensive reporting of the methods that are predefined and reproducible.[98] The steps in the process include the development of a study protocol; an explicit statement of the research question(s) pursued by the review; delineation of the eligibility criteria used to select studies; details of the search strategy used to locate both published and unpublished literature; a clear explanation of how studies were selected and critically appraised; and how primary data was extracted and synthesised from the studies chosen for inclusion in the review.[101] Systematic literature reviews have long been regarded the foundation stone of evidence-based medicine and health care and have traditionally been used to answer questions on the safety and effectiveness of medical interventions. However, given their reputation as a gold-standard source of evidence-based information, systematic reviews are increasingly being used to inform policy and practice decisions and to direct future research across a broad range of contexts and professional disciplines, including within the field of social work and education.

Chapter 2 Systematic Review

This review was undertaken in accordance with an *a priori* protocol[96] (see Appendix 1). Two revisions were made to the criteria set out in the *a priori* protocol[96] after its publication. The PRISMA guidelines state that modifications to *a priori* protocols are a common occurrence given the iterative nature of the review process and should be reported in a transparent manner.[103] Accordingly, revisions to the *a priori* inclusion criteria have been explicitly detailed in the relevant sections below.

2.1 Types of participants

This review considered studies that included children and adolescents (<18 years) placed formerly or currently in formal or informal OOHC. Formal OOHC was defined as "overnight care for children aged 0 to 17 years where the state or territory makes a financial payment."[1, p45] The inclusion criteria was modified from the *a priori* protocol[96] to also include children in informal OOHC placements. Children placed in informal OOHC settings were selected for inclusion in the present review because they often experience elevated rates of child and family risk factors (lower socio-economic status, lower mean pre-academic skills, higher rates of special needs and behaviour problems) that place them at greater risk of academic failure than their peers from other at-risk populations, such as those from low socioeconomic backgrounds.[104] Informal OOHC was defined as the placement of children and adolescents aged 0 to 17 years in a kinship care arrangement on a voluntary basis without the involvement of statutory child protection agencies or court authorities.[105] As OOHC is variably defined within the literature, any definition of OOHC reported by study authors was accepted if it was comparable to the definitions outlined in the present review.[1, 105] This definition included a) children placed in OOHC due to risk of harm resulting from a child protection substantiation and b) children placed in OOHC due to parental incapacity. Examples of eligible OOHC placement settings included foster care, kinship care, group homes, residential care and independent living arrangements. This review excluded studies that involved a) young people on juvenile justice orders placed in OOHC as result of chronic delinquency or criminal offences, b) children placed in OOHC for serious emotional disturbance or psychiatric illness, and c) children and young people with disabilities placed in an OOHC respite arrangement.

2.2 Types of interventions

Studies were considered for inclusion in this review if they evaluated interventions designed to improve the academic outcomes of children and adolescents in OOHC. Interventions could be delivered at the individual-, caregiver- or system-level and could vary in the components they comprised. This included variation in the theoretical basis, format, duration, intensity, and content of the intervention, as well as the context or setting in which it was delivered. Examples of eligible interventions included reading or spelling programmes; individualised educational support (i.e., tutoring); early childhood education; distribution of learning materials or resources; and programmes designed to increase the partnership, collaboration or organisation between the educational system and child welfare services.

2.3 Types of comparators

Studies with a valid control group were included in the present review. Interventions could be compared with an inactive control group (e.g., no treatment or wait-list control) or an active control group (e.g., 'services as usual' or alternative treatment group).

2.4 Types of outcomes

This review included studies that reported on the academic achievement of children or adolescents in OOHC. Academic achievement was selected as a primary outcome because it is the endpoint of education and consequently the most important outcome for directly improving the academic capacity of children and adolescents in OOHC and the future educational and employment opportunities available to them. Accordingly, it is also the outcome of most interest to a range of decision-makers wishing to improve the educational standing of students in OOHC. As outlined in the Cochrane Handbook for Systematic Reviews of Interventions,[98] primary outcomes are those that will be the subject of analysis and will form the basis for conclusions about the effects of the interventions under investigation. School performance was selected as a secondary outcome used to evaluate the additional effects of an intervention beyond its impact on academic achievement.[98] As such, secondary outcome data was extracted only from studies that reported on primary outcomes.

2.4.1 Primary outcome (academic outcomes)

- Achievement in an academic domain (e.g., reading, writing, spelling, mathematics, etc.) measured using school grades, GPA, scores on age standardised measurements (e.g., California Achievement Test, Stanford Achievement Test, Wide-Range Achievement Test etc.), or teacher assessments or ratings. Studies reporting proxy measures of academic achievement (e.g., homework completion) were excluded.

2.4.2 Secondary outcomes (school outcomes)

- Indicators of school performance including rates of school attendance, disciplinary referral, suspension, expulsion, school dropout and graduation.

2.5 Types of studies

Randomised controlled trials were considered for inclusion in this review. This is a deviation from the planned *a priori* protocol,[96] (see Appendix 1) which stipulated that less robust study designs such as non-randomised controlled trials, quasi-experimental, and before-and-after studies would also be considered for inclusion. At the protocol development stage it was unclear to the review author what types of study designs would be available to best answer the research question, therefore an all-inclusive approach to study selection was chosen. However, as the comprehensive search uncovered a number of RCTs relevant to the research question it was decided to limit the review to these types of studies only. This approach was taken in accordance with widespread consensus that RCTs are the best source of evidence for reviews of effectiveness as they can isolate treatment effects from other confounding variables that can impact on the study outcomes and produce erroneous conclusions about an interventions' effectiveness.[97-99] In addition, a systematic review examining the same research question as the present investigation was located after the development and publication of the planned protocol[96] for this review and included poor quality quasi-experimental and before-and-after studies identified in the comprehensive search strategy.[79] As the present review was interested in using the best available evidence to address the research question it was considered redundant to include studies lower in the evidence hierarchy (e.g., quasi-experimental, and before-and-after studies).[97]

2.6 Review Method

2.6.1 Search strategy

A comprehensive, three-step search strategy was conducted between December 2014 and January 2015. The search aimed to find both published and grey literature relevant to the review question. First, a scoping search comprising a few select keywords (i.e., foster care AND education) was conducted in ERIC, PsycINFO and Google Scholar to locate topic specific studies. Key concepts and terms for the comprehensive search were identified through examination of the titles and abstracts of retrieved articles and the keywords and index terms used to describe their content.

A second search using all the identified text words and index terms was adapted and applied to five electronic databases: ERIC (via Proquest), PsycINFO (Ovid SP interface), PubMed (pubmed.gov), Social Services Abstracts (via Proquest) and Sociological Abstracts (via Proquest). The search strategy comprised two key concepts: a) keywords broadly related to education and b) keywords related to the OOHC population. All searches were restricted to English language publications. Due to the potential scarcity of eligible studies the search was not restricted by year of publication. The search for unpublished studies was performed in Proquest (Dissertations and Theses), Google and Google Scholar. Various OOHC organisational websites were also searched to identify potentially relevant grey literature reports. Details of the databases searched including the complete set of search strategies are presented in Appendix 2. To supplement the above electronic searches, a third search was undertaken that involved manually screening the reference lists of included studies and topic reviews to identify potentially relevant studies not captured by the database searches.

2.6.2 Study selection

Citations retrieved from the database and grey literature searches were exported into bibliographic citation software (EndNote X7, Thomson Reuters, New York, USA) to facilitate study selection. To identify relevant studies, the titles and abstracts of all records were scanned and their eligibility assessed against the inclusion criteria. If an abstract contained insufficient information to determine eligibility, the article was retrieved and the full-text screened. Citations that did not meet the review's inclusion criteria were excluded.

2.6.3 Assessment of methodological quality

A standardised critical appraisal instrument for experimental studies (Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument; JBI-MAStARI; see Appendix 3) was used by three independent assessors to appraise the methodological rigour of eligible studies prior to their inclusion in the review.[99] One reviewer assessed all included studies while the remaining assessors appraised three discrete studies each. The independent quality ratings ascribed to each study by appraisers were compared. Discrepancies between the quality ratings were resolved through discussion between the assessors until consensus on all ratings was achieved. Methodological limitations not captured by the critical appraisal instrument were also documented for each study where applicable.

2.6.4 Data extraction

Data relevant to the review question were extracted from the included studies using a customised data extraction template (Appendix 4). Specifically, the following descriptive data were extracted: country of study origin; study design and length of follow-up; population characteristics including participant's age, gender, OOHC placement setting, and applied inclusion and exclusion criteria; sample size and study attrition; intervention characteristics including the name, objectives, content, components, format, duration and intensity of the intervention and the setting in which it was delivered; study outcome measures and statistical analyses; and results pertaining to the comparative effectiveness of the intervention being evaluated i.e., difference in outcomes between treatment and control conditions. One reviewer extracted the relevant data from each included study.

2.6.5 Data synthesis

Due to the methodological diversity across the included studies, (e.g., risk of bias and study design) (see Section 3.2) the studies were considered heterogeneous and a meta-analysis or other quantitative method of statistical pooling was determined to be inappropriate.[106] Consequently, a narrative synthesis of the comparative effectiveness outcome data (e.g., between-group differences) was conducted. Results from statistical analyses, including effect sizes (ES), are reported as provided by authors in the original studies; no additional ES calculations were performed. Confidence intervals for statistical data were not reported by any of the included studies. Data on methodological quality and

characteristics of the included studies are presented in tables and accompanied by a descriptive summary.

Chapter 3 Results

3.1 Study inclusion

The results of the literature search and the process of study selection and inclusion are shown in Figure 1. The search for published literature retrieved a total of 7,294 records across all included databases (ERIC: 2411; PsycINFO: 1623; PubMed: 1216; Social Services Abstracts: 1393; Sociological Abstracts: 651). The search for grey literature retrieved 1,480 records from the Proquest Dissertations and Theses database. No additional articles were identified through the search of Google, Google Scholar and various OOHC organisational websites (see Appendix 2), or through the manual screening of reference lists across the included studies and previous reviews on the topic.[79, 80] A total of 1,511 duplicate records were identified and removed from subsequent analysis.

Titles and abstracts of the remaining 7,263 unique citations were screened for eligibility. Thirty-five studies were retrieved in full-text and assessed for compliance with the inclusion criteria. A further 29 studies were ineligible for inclusion after full-text examination: five studies employed an ineligible study design (e.g., case study); 15 studies investigated an ineligible population (e.g., participants aged ≥18 years; children in residential treatment for delinquency or emotional and behavioural disturbance etc.); six studies examined ineligible outcomes (e.g., homework completion etc.); two studies were not primary research; and one study reported no intervention (Appendix 5). A total of six studies met the review's inclusion criteria, were critically appraised, and subsequently included in the review.[31, 33, 88, 104, 107, 108]
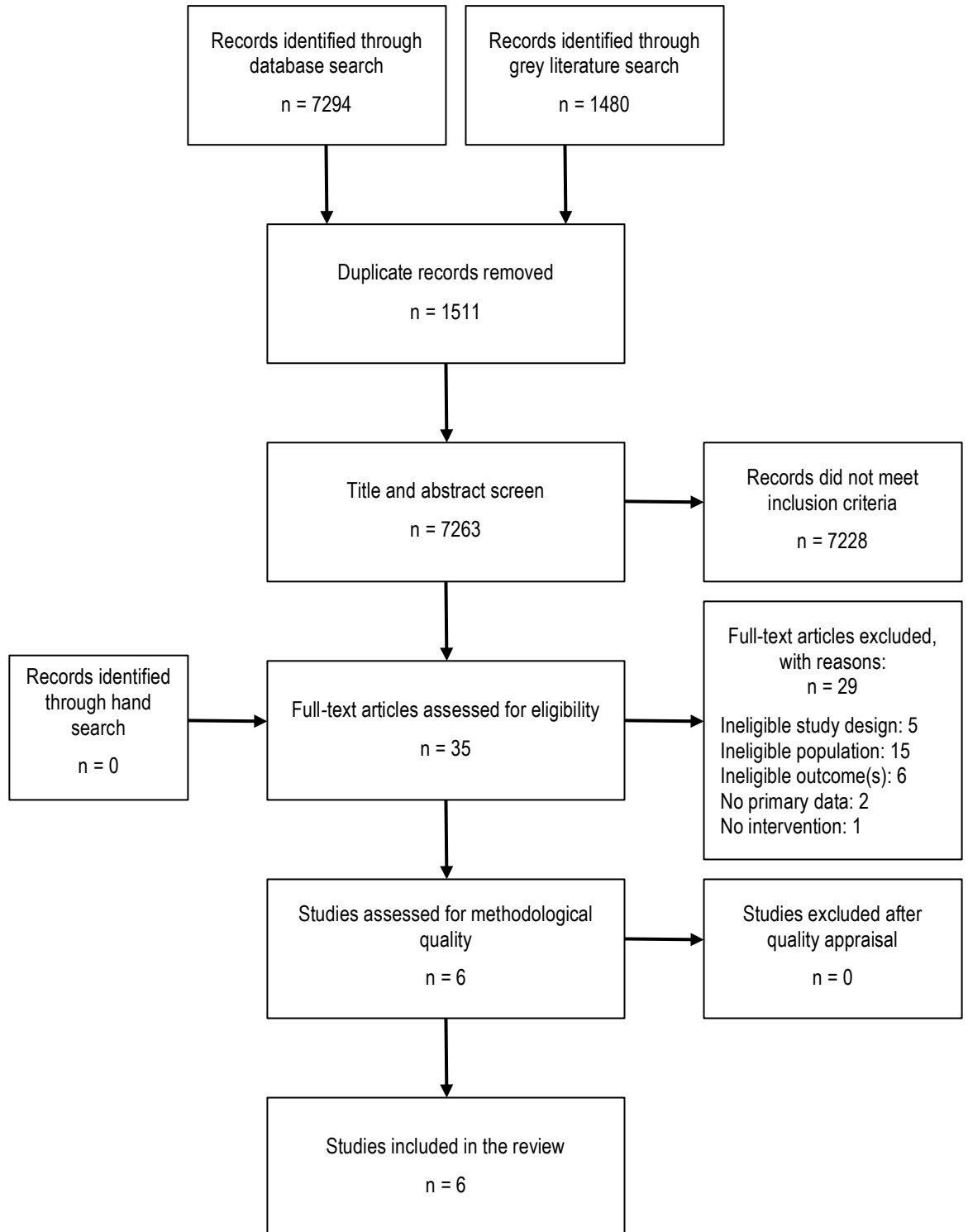
Figure 1. Flow diagram outlining the process of study inclusion

3.2   Methodological quality of the included studies

The results of the critical appraisal are summarised in Table 1. The methodological quality of the six included studies[33, 88, 89, 104, 107, 108] was difficult to determine due to instances of inadequate reporting of methodological information. Studies commonly failed to sufficiently describe how the study was conducted resulting in an *unclear* response being assigned to multiple quality criteria. The study by Lipscomb et al[104] obtained data from the Head Start Impact Study[109] for the subset of the sample who resided in OOHC. As such, the original Head Start Impact Study[109] report was referred to when extra information about Head Start or the method used to undertake the study was required. Overall, the majority of studies were at risk of selection, performance and detection bias, few studies addressed study attrition and an intention-to-treat (ITT) analysis was seldom performed.

Table 1. Results of the critical appraisal of the included studies

Included study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
Pears et al[108]	U	N	U	N	Y	Y	Y	Y	Y	Y	**6**
Lipscomb et al[104]	U	N	U	Y	U	U	U	Y	Y	Y	**4**
Flynn et al[33]	Y	N	U	N	U	Y	Y	Y	Y	Y	**6**
Harper[88]	Y	N	U	N	U	Y	Y	Y	Y	Y	**6**
Courtney et al[89]	U	N	U	Y	U	Y	N	Y	Y	Y	**5**
Geenen et al[107]	U	N	U	N	U	U	Y	Y	Y	Y	**4**

See Appendix 3 for appraisal questions. Abbreviations: Y = yes; N = no; U = unclear. The total column contains the overall methodological quality score of each study (out of a possible 10), calculated by summing the number of 'yes' responses awarded to the critical appraisal questions.

All studies reported random assignment of participants to study conditions[33, 88, 89, 104, 107, 108] however only two studies[33, 88] reported the method of randomisation utilised in enough detail to confirm that true randomisation had occurred (e.g., research randomiser; permuted-block randomisation). None of the studies[33, 88, 89, 104, 107, 108] reported participants were blinded to the study intervention as was expected given the inherent difficulty of blinding participants to educational interventions.[110] In two studies, participants were randomised into treatment or control groups prior to recruitment placing them at

higher risk of selection bias.[88, 108] In both studies, child welfare workers needed to provide consent for eligible young people to participate in the study,[88, 108] however it was unclear whether child welfare workers had foreknowledge of the young person's group allocation (treatment versus control) prior to assessing their eligibility and suitability and whether research staff knew referee's group assignment or personal background prior to their recruitment.[88, 108] Foreknowledge of a young person's individual characteristics as well as their group assignment may have influenced child welfare worker's decision on who should participate in either condition. Similarly, research staff may have recruited eligible participants differentially based on their knowledge of the child's individual characteristics and their group assignment. In contrast, the remaining studies recruited eligible individuals before they were randomised to study conditions.[33, 89, 104, 107] Of these, the Flynn et al[33] study carried the lowest risk of selection bias given that true randomisation could be confirmed. However, selection bias may have been introduced into the randomisation process of the remaining studies[89, 104, 107] since neither independent allocation nor true randomisation could be verified from the information provided. In the Courtney et al[89] study it was unclear what role the allocator played in selecting or assigning participants into designated treatment or control conditions or how this was achieved. The Head Start Impact Study[109] reported that research staff received information about candidates seeking to participate in the programme prior to their randomisation, while participants in the Geenen et al[107] study completed baseline assessments before being randomly assigned to treatment or control conditions. Foreknowledge of participant's individual characteristics prior to their randomisation may have influenced the study condition each child was allocated to.

Despite the possibility that selection bias may have been introduced across the included studies where true randomisation or allocation concealment could not be verified, in all but two studies[104, 107] it was clear that participants in the intervention and control groups were comparable at study entry across a range of characteristics assessed at baseline.[33, 88, 89, 108] Overall, the included studies made a poor attempt to account for the effects of study participant withdrawals and dropouts. While most studies reported the general reasons for participant withdrawal and/or the attrition rate[33, 88, 89, 107] only two studies included these individuals in an intent-to-treat analysis (ITT).[89, 104] The study by Pears et al[108] reported 27 families withdrew from the intervention group prior to the baseline assessment but did

not report on any participant dropouts thereafter making it unclear whether study findings were based on the entire sample that entered the study. As a result of participant dropouts in the study by Harper[88] groups were unequal at post-test, with those in the intervention condition scoring significantly lower on pre-test measures of sentence comprehension and mathematics. Lipscomb et al[104] reported that an ITT analysis was undertaken to determine the effects of the intervention based on the condition that children were originally allocated to; however, the details of the analysis, including the number of children who had dropped out of the study and their outcomes, were not reported.

With the exception of the Pears et al[108] study, none of the remaining studies reported whether data collectors were blinded to group assignment increasing the risk of detection bias.[33, 88, 89, 104, 107] Little detail was provided across the included studies on whether participants across the intervention and control groups were treated equally other than for the named interventions,[33, 88, 89, 104, 107, 108] however, for the most part, it was apparent that analyses, measurement of outcomes and contact with study personnel were consistent across conditions. Implementation fidelity of intervention components was generally high across studies that reported fidelity outcome data.[33, 107, 108] Given it would be unethical to withhold educational programmes or adjunct services to participants not assigned to receive the evaluated intervention, some variation between the educational and therapeutic experiences of children in the control and intervention groups was present in studies that employed a 'services as usual' comparator (see Table 2).[89, 104, 107, 108] Studies by Courtney et al[89] and Lipscomb et al[104] also reported the presence of contamination bias due to violations of the assignment protocol wherein a proportion of control participants received the intervention (i.e., crossovers) and a proportion of participants in the intervention did not (i.e., dropouts). The presence of crossovers and dropouts was addressed statistically by both studies using an ITT analysis.[89, 104]

Academic outcomes across conditions were measured the same way within the included studies.[33, 88, 89, 104, 107, 108] With the exception of one study[107] all studies also used reliable and validated instruments to assess academic ability minimising the influence of detection bias on study findings.[33, 88, 89, 104, 108] The Pears et al[108] study utilised three measures to derive a composite score for early literacy skills. Although two were validated instruments, the third comprised caregiver's assessment of their child's reading skills, which may have introduced detection bias and superficially inflated the overall outcome score for early

literacy.[108] All the included studies used appropriate statistical analyses.[33, 88, 89, 104, 107, 108]

3.3 Characteristics of included studies

A summary of the characteristics of the included studies is presented in Table 2 with studies involving the youngest participants listed first. Given the age at which students enter certain school grades varies across countries and jurisdictions, study participants were categorised throughout this section and the remainder of this thesis in accordance with the South Australian educational system, namely, study participants between the ages of three and five were categorised as preschool children, study participants between the ages of six and 13 were categorised as primary school children, and study participants between the ages of 14 and 17 years were categorised as high school adolescents.

3.3.1 Study design

All six included studies utilised a randomised controlled study design with pre- and post-assessment of academic outcomes and a wait-list control[33, 88] or a 'services as usual' comparator group.[89, 104, 107, 108] More details of the activities undertaken by control participants are provided in Table 2. The duration of studies (including the follow-up period) ranged from 2-months[108] to approximately 2-years.[89] Half of the studies did not conduct a follow-up assessment.[33, 88, 108] The remaining studies followed-up participants at 9-months[107] and 12-months[104] after the conclusion of the intervention, and the study by Courtney et al[89] followed-up participants at 12-months and approximately 24-months after baseline assessment.

3.3.2 Geographical location

Four studies were conducted in the United States[89, 104, 107, 108] and two in Canada.[33, 88] Both the United States and Canada have a comparable OOHC system to Australia.[3]

Table 2. Characteristics of the included studies

Study	Study Design	Population	Intervention	Outcome measures / Analysis	Results
Pears et al[108] USA	RCT **Follow-up:** NR	**Sample size:** $N = 192$ Intervention: $N = 102$ Control: $N = 90$ **Attrition:** NR **Age:** Intervention: $M = 5.26$, $SD = 0.33$ Control: $M = 5.25$; $SD = 0.35$ **Gender:** Male 52%; Female 46% **Placement type:** Foster and kinship care **Inclusion criteria:** kinship or foster care placement in the Pacific Northwest, USA; entering kindergarten in the fall; mono-lingual or bilingual English speaker; not involved in another treatment protocol closely related to the KITS Programme.	Kids in Transition to School (KITS) Graduate-level teachers and two assistant teachers taught preschool children school readiness skills (early literacy, pro-social and self-regulatory skills) using instruction, role-playing and activity-based intervention to prepare them to make a successful transition into kindergarten. Caregivers were taught behaviour management skills and skills relevant to the kindergarten transition. **Training:** 40-hours of standardised training. **Implementation fidelity:** Trained coders assessed implementation fidelity through live observation or via videotape. Overall fidelity: 98% of key curriculum components. **Control:** services as usual e.g., psychological or speech therapy, education programmes not associated with KITS. **Duration:** 2-months before kindergarten **Intensity:** Children: 16 sessions; 2-hours, twice a week Caregivers: 4 sessions; 2-hours every 2 weeks **Format:** groups of 12 to 15 children **Setting:** centre-based	Early literacy skills • Dynamic Indicators of Basic Early Literacy Skills (DIBELS) • 24-item Concepts About Print test • Caregiver rating of pre-reading skills **Analysis:** Structural equation modelling **Effect size:** *d*, formula for independent-groups pretest-posttest design (Feingold, 2009)	+ Early literacy ES = 0.26

Lipscomb et al(104) USA	RCT **Follow-up:** 12-months	**Sample size:** *N* = 253 Intervention: *N* = 154 Control: *N* = 99 **Attrition:** NR **Age:** 3 to 4 year olds Intervention: *M* = 48.25 months; *SD* = 6.70 Control: *M* = 47.79 months; *SD* = 7.29 **Gender:** Male 53%; Female 47% **Placement type:** formal and informal OOHC **Inclusion criteria:** 3 and 4 year old children from at-risk populations living in OOHC defined as primary caregiver who self-identified as someone other than a biological, adoptive or step-parent.	Head Start A school readiness programme preparing low-income preschool children and their families for kindergarten by targeting children's pre-academic skills, externalising behaviour and teacher-child relationships. The programme offers early childhood education and a range of comprehensive adjunct services including health, nutrition, parental support and wrap-around services. **Training:** NR **Implementation fidelity:** NR. However, children's experiences within Head Start varied owing to the many different programme sites attended by participants. **Control:** services as usual e.g., formal and informal early childhood education **Duration:** 12-months **Intensity:** Variable across participating centres **Format:** one-on-one and group instruction **Setting:** predominantly centre-based	Pre-academic skills (i.e., pre-reading, letter and word identification, developing mathematics and early writing and spelling skills). • Woodcock-Johnson III subtests Letter-Word Identification, Spelling and Applied Problems **Analysis:** Structural equation modelling – path analysis. Head Start Impact Study[109] conducted ITT analysis. **Effect size:** standardized coefficients	+ Pre-academic skills (post-intervention) ES = 0.16 0 Pre-academic skills at 12-month follow-up*
Flynn et al [33] Canada	RCT **Follow-up:** NR	**Sample size:** *N* = 77 Intervention: *N* = 42 Control: *N* = 35 **Attrition:** Intervention: 28.6% Control: 2.9%	Teach Your Children Well (TYCW) Trained foster parents delivered one-on-one, individualised, direct instruction tutoring to their foster child (maximum of two foster children) each week within the family home with the aim of improving their academic achievement. A behavioural management component was incorporated to facilitate children's engagement with the educational content.	Word Reading, Spelling, Math Computation, Sentence Comprehension and Reading Composite (Sentence Comprehension & Reading). • Wide Range Achievement Test Fourth Edition (WRAT-4)	+ Sentence Comprehension ES = 0.38 + Math Computation ES = 0.46

	Participant characteristics	Intervention	Analysis	Outcomes
	Age: 6 to 13 years; *M* = 10.7, *SD* = 1.6 **Gender:** Male 46%, Female 54% **Placement type:** Foster or kinship care **Inclusion criteria:** likely to benefit from tutoring delivered by foster parent; fluent in English; in a stable placement; crown or society ward; likely to remain in care for the duration of the study; willing to sign consent. **Exclusion criteria:** group home placement; very strong or weak academically; behaviourally disturbed (and thus not likely to benefit).	**Training:** 6-hour training session **Implementation fidelity:** Weekly reports on how many lessons tutors had implemented, the number of weeks of actual tutoring and the average number of hours dedicated to tutoring. 70 per cent of children experienced a high level of intervention fidelity (children who received approx. 25 weeks or more of tutoring; 60 lessons or more, or 30 lessons for young children in the TYCW reading books, and had spent a substantial amount of time on the different components of the tutoring process per week). **Control:** wait-list **Duration:** 30-weeks **Intensity:** 3-hours per week: foster parents delivering 2-hours of direct reading instruction; foster children reading aloud for 30-minutes; and 30-minutes of self-paced, computer-based math instruction undertaken by foster child under parental supervision. **Format:** one-on-one tutoring **Setting:** home-based	**Analysis:** Analysis of covariance (ANCOVA) Cohen's U_3 improvement index. **Effect size:** Hedge's *g*	0 Word Reading 0 Spelling 0 Reading composite
Harper[88] Canada RCT **Follow-up:** NR	**Sample size:** *N* = 101 Intervention: *N* = 51 Control: *N* = 50 **Attrition:** 9.9% **Age:** 6 to 13 years *M* = 9.93, *SD* = 1.9 **Gender:** Male 57%; Female 43%	Teach Your Children Well (TYCW) One or two trained university student volunteers delivered individualised direct instruction tutoring to groups of children of a similar skill level with the aim of improving student's academic achievement. A behavioural management component was incorporated to facilitate children's engagement with the educational content.	Word Reading, Spelling, Math Computation, and Sentence Comprehension • Wide Range Achievement Test Fourth Edition (WRAT-4) **Analysis:** Multilevel modelling analysis for Word Reading.	+ Word Reading ES = 0.40 + Spelling ES = 0.25 + Math Computation ES = 0.34

Study / Country	Design	Sample characteristics	Intervention	Analysis	Outcomes
		Placement type: Long-term kinship or foster care. **Inclusion criteria**: behind in academic achievement but not intellectually challenged (i.e. IQ>70); grades 1 to 8 inclusive; able to exhibit sufficient behavioural control and remain in the study for the duration of the intervention.	**Training:** two full days. **Implementation fidelity:** Tutors submitted number of lessons completed by each student for both math and reading and student performance data (measured sound fluency, word fluency, and story fluency to the project coordinator. Fidelity to treatment data NR. **Control:** wait-list. **Duration:** 30-weeks, actual duration ranged between 25 and 29 weeks. **Intensity:** 2-hours per week. **Format:** groups of 3 to 5 children. **Setting:** centre-based	ANCOVA for remaining WRAT-4 subscales. Cohen's U_3 improvement index. **Effect size:** Hedge's *g*	0 Sentence Comprehension
Geenen et al[107] USA	RCT **Follow-up:** 9-months	**Sample size:** *N* = 133. Intervention: *N* = NR. Control: *N* = NR. **Attrition:** 10.5%. **Age:** 14 to 17 years *M* = 15.49, *SD* = 2.21. **Gender:** Male 53.7%, Female 46.3%. **Placement type:** Foster care, kinship care, group homes. **Inclusion criteria**: in high school, special education and state foster care system, living within the studies targeted geography.	Take Charge. A self-determination enhancement programme for promoting the academic and school performance of OOHC adolescents in special education. Participants received individualised coaching in applying self-determination skills and attended group-mentoring workshops with near-peer foster care alumni. **Training:** All coaches undertook formal training and observation. **Implementation fidelity:** Overall fidelity for 79 coaching elements across was 90.68%. **Control:** services as usual e.g., provision of typical educational services. **Duration:** 9-months	GPA, credits earned toward graduation • School transcripts. School dropout • Outcome survey administered to youth and verified by school records. **Analysis:** mixed models analyses. **Effect size:** mean differences between groups divided by estimated standard deviation.	0 GPA. 0 Credits earned toward graduation at post-intervention. + Credits earned toward graduation at follow-up, ES = 0.45. 0 School dropout

			Intervention	Outcome measures	Outcomes
			Intensity: 60 to 90 min sessions per week; an average of 32.97 coaching hours (SD = 8.71) received; range: 13 to 55-hours. **Format:** Individualised coaching and group mentoring workshops **Setting:** centre-based		
Courtney et al[89] USA	RCT **Follow-up:** 1st: approx.12-months 2nd: approx. 24-months (after baseline assessment)	**Sample size:** N = 445 Intervention: N = 236 Control: N = 209 **Attrition:** 9.6% **Age:** 14 to 15 years M = 14.5, SD = 0.8 **Gender:** Male 46%; Female 54% **Placement type:** all placement types that fall under the guardianship of the Minister (e.g., foster, kinship, group homes etc.). **Inclusion criteria:** youth aged 14 or 15 years one to three years behind their school grade in either reading or mathematics.	Early Start to Emancipation Preparation (ESTEP) tutoring programme An independent living programme designed to prepare OOHC youth for emancipation. Trained local college students delivered individualised, one-on-one tutoring to youth in reading and mathematics and provided mentoring services to students during tutoring sessions. Participants were encouraged to utilise educational services and resources and had access to other independent living workshops provided by the programme. **Training:** one-day training prior to intervention and additional training during the year (two or three times a year). **Implementation fidelity:** NR. **Control:** services as usual e.g., similar tutoring services to those in the ESTEP programme from alternative sources. **Duration:** maximum of 50 tutoring hours plus 15-hours of mentoring or other activities **Intensity:** 2-hours, twice a week. Youth received: M = 18-hours of math, 17-hours of reading tutoring.	Reading and Mathematics • Woodcock-Johnson III subtests Letter-Word Identification; Calculation; Passage Comprehension GPA • Self-reported school grades for English or language arts; mathematics; history or social studies; and science, during previous school semester, scored on 4-point scale (A = 4 through to D or lower = 1) and averaged to derive an overall student GPA. Highest grade completed • Self-reported data verified by school records Graduation • Self-reported data on whether high school diploma or general	0 Reading 0 Mathematics 0 GPA 0 Highest grade 0 Graduation 0 School behaviours

Format: one-on-one tutoring **Setting**: predominantly home-based	equivalency diploma was obtained verified by school records School-related behaviour problems • Self-reported data measured on a 5-point scale (never (0) to every day (5)). School behaviours included getting along with teachers, paying attention in school, getting homework done, getting along with other students and arriving on time for class. **Effect size:** *Glass' Δ* i.e., (ESTEP-control)/control *SD* **Analysis:** ITT analysis and a series of instrumental variable models. Impact analyses were based on 2nd follow-up data as participation in the intervention was still proceeding at 1st follow-up.

Abbreviations: *N* = number of participants; *M* = mean; *SD* = standard deviation; ES = effect size; *direct effects of the intervention on early literacy; NR = not reported; + statistically significant difference between groups; 0 no statistically significant difference between groups

3.3.3 Study population

A total of 1,201 OOHC children were included across all studies. Participants varied by age and school grade level. Two studies included preschool children (three to five years of age).[104, 108] The youngest sample comprised children with an approximate mean age of four years (intervention group: N = 154, M = 48.25 months, SD = 6.70; control group: N = 99, M = 47.79; SD = 7.29).[104] Interventions in studies by Harper[88] and Flynn et al[33] targeted primary school students between six and 13 years of age. The Geenen et al[107] study included high school adolescents between 14 and 17 years of age (M = 15.49 years) while the study by Courtney et al[89] involved students 14 and 15 years of age (M = 14.5 years).

With the exception of the Lipscomb et al[104] study, all study participants carried the legal status of state wards (i.e., children in the custody of a public child welfare agency). In the study by Lipscomb et al[104] OOHC constituted a primary caregiver who identified as someone other than the child's biological, adoptive or step parent, and consequently, the study included children in both formal and informal OOHC living arrangements.[109] While all studies included children in foster or kinship care[33, 88, 89, 104, 107, 108] Geenen et al[107] and Courtney et al[89] also included children living in group homes.

The majority of studies recruited children through child welfare workers who ultimately determined whether a young person was suitable for inclusion in the study or not.[33, 88, 89, 107, 108] Studies by Harper[88] and Flynn et al[33] only included children likely to benefit from the intervention. For example, eligible children had to be in a stable foster or kinship care placement and exhibit adequate cognitive capacity and behavioural control.[33, 88] Two studies targeted OOHC students with a greater number of individual-level risk factors.[89, 107] Geenen et al[107] only included students in receipt of special education services due to a range of vulnerabilities (e.g., emotional, behavioural, attendance issues etc.) while Courtney et al[89] only included youth one to three years behind their school grade in either reading or mathematics with a large percentage (47 per cent) of youth also reporting significant mental health or behavioural problems.

3.3.4 Intervention characteristics

3.3.4.1 Programme and components

Two studies evaluated the effectiveness of school readiness programmes, namely the Kids in Transition to School (KITS) programme[108] and Head Start,[104] which aimed to improve the pre-academic skills of preschool children (three to five years) in OOHC prior to their entry into kindergarten. Three studies assessed the impact of tutoring on OOHC student's mathematics and reading skills.[33, 88, 89] Two of these studies evaluated the Teach Your Children Well (TYCW) direct instruction tutoring programme, delivered to primary school children (six to 13 years) in foster and kinship care[33, 88] while the other study evaluated the Early Start to Emancipation Preparation (ESTEP) tutoring intervention that was delivered as part of an independent living programme designed to prepare OOHC adolescents (14 and 15 years of age) for emancipation.[89] One study examined the impact of the Take Charge self-determination enhancement programme to improve the academic and school performance of OOHC high school adolescents (14 to 17 years of age) in special education.

All studies examined multi-component interventions that focused on targeting individual-level risk factors and barriers to educational attainment in the OOHC population.[33, 88, 89, 104, 107, 108] Five of the six studies sought to improve academic outcomes by directly targeting children's academic deficits and gaps in knowledge through tutoring and/or activity-based instruction[33, 88, 89, 104, 108] while one study instead targeted participant's self-determination skills through individualised coaching and group mentoring.[107] Four of the interventions targeting individual-level academic skill and knowledge deficits also incorporated a component that sought to either improve or manage behavioural issues to facilitate children's engagement with the educational content and learning environment.[33, 88, 104, 108] The remaining two studies included adjunct components that focused on equipping adolescent students with educational planning skills and knowledge on how to utilise educational resources available to them.[89, 107] Three of the six studies also added a third component that focused on facilitating caregiver's involvement in their child's education.[33, 104, 108] No eligible studies focusing solely on targeting caregiver- or system-level barriers to OOHC children's educational attainment were located or included in the present review.

3.3.4.2   Duration and intensity

The duration of interventions, excluding the follow-up period, ranged from 2-months[108] to 12-months[104] (see Table 2). Duration and intensity of intervention sessions also varied across the included studies and ranged from approximately 1.5-hours per week[107] to 4-hours per week (two, 2-hour sessions per week).[89, 108]

3.3.4.3   Delivery and format

Intervention sessions were delivered by a variety of individuals including caregivers, graduate-level teachers, near-peers and university student volunteers. Two studies delivered intervention sessions in a small group-based format,[88, 108] two studies delivered sessions using an individual, one-on-one format,[33, 89] and two studies utilised both individual and group-based formats to deliver varying components of their programme.[104, 107] Tutors and coaches received between six[33] to 40-hours[108] of training on how to implement intervention components (see Table 2).

3.3.4.4   Setting

All interventions were conducted outside the school environment: two studies delivered intervention sessions within the participant's home[33, 89] while the remainder implemented intervention sessions primarily in centre-based classroom settings outside the home environment.[88, 107-109]

3.3.4.5   Analysis

Two studies utilised structural equation modelling methods to compare the direct and indirect effects of the intervention relative to the control condition on preschool children's pre-academic skills.[104, 108] Two studies[33, 88] conducted an analysis of covariance (i.e., ANCOVA) to determine whether standardised post-test scores differed between primary school children who received the TYCW tutoring intervention compared to those in a wait-list control while controlling for participant's baseline test scores. The study by Geenen et al[107] undertook mixed models analyses to assess intervention effects on baseline to post-intervention results and post-intervention to follow-up results by group assignment, while Courtney et al[89] conducted an ITT analysis and a series of instrumental variable models to determine the effect of the ESTEP tutoring programme on adolescent's academic and school outcomes compared

3.3.4.6   Outcomes

A range of academic outcomes was examined by the included studies. Two studies measured children's pre-academic skills such as early literacy,[108] pre-reading, letter and word identification skills, developing mathematics, early writing and spelling skills.[104] Three studies measured student's mathematics and reading skills[33, 88, 89] and two of these also measured spelling skills.[33, 88] One study measured academic achievement solely using student's GPA.[107] In addition to academic outcomes, two studies measured school performance outcomes including high school dropout and graduation,[89, 107] credits earned toward graduation,[107] grade completion and school behaviour.[89] Outcomes were measured using various tools. Two studies used the Wide Range Achievement Test – Fourth Edition (WRAT-4),[33, 88] two studies used the Woodcock-Johnson Tests of Achievement III scale,[89, 104] and one study derived a composite score of early literacy skills.[108] One study obtained student's GPA from school transcripts[107] while the other computed student's GPA from self-reported school grade data.[89] School graduation rates, grade completion and school behaviour were acquired through self-report methods[89] and school dropout rates were obtained via self-report surveys verified by school records.[107]

3.4   Study findings

In this section, findings are presented according to the school age of the intervention's targeted population with similar terminology used for categorisation as in Section 3.3. Due to heterogeneity across the included studies (see Section 3.2 and 3.3) the study findings are presented in narrative form.

3.4.1   Interventions for preschool aged children in OOHC

3.4.1.1   Kids in Transition to School (KITS) programme

The study by Pears et al[108] found that compared to the 'services as usual' control, the KITS programme demonstrated a statistically significant and positive effect ($\beta = .10$, $p < .05$) on the early literacy skills of preschool foster care children in the intervention group at post-intervention even after variables measured at baseline were controlled (i.e., gender, type of foster care, ethnicity, baseline early literacy scores, cognitive ability, and

prior childhood education). The size of the intervention effect for the improvement in early literacy skills was *d* = 0.26.[108]

3.4.1.2   Head Start programme

The study by Lipscomb et al[104] similarly found that compared to the 'services as usual' condition, Head Start significantly predicted gains in children's pre-academic skills at post-intervention (after 12-months) after controlling for children's baseline competencies, as well as child-level (sex, age, caregiver report of child's special needs) and family-level covariates (income-to-need ratio, dyad reading at home, household income, caregiving style and change in primary caregiver during study period), β = .16, *SE* = 0.07, *p* = .02. The magnitude of the standardised effect of Head Start on children's pre-academic skills (β = .16, *p* = .02) at post-intervention indicated that preschool children in Head Start made a modest and significant improvement in pre-academic skills compared to those in the 'services as usual' comparator. At the 12-month follow-up (12-months after the end of Head Start) Head Start had no direct effect on children's pre-academic skills when compared to the control condition, however, the intervention was found to have a positive and statistically significant indirect impact on preschool children's pre-academic skills β = .12, *SE* = .06, *p* = .05, that was mediated by gains in pre-academic skills and positive teacher-child relationships obtained during the Head Start year.[104]

3.4.2   Interventions for primary school aged children in OOHC

3.4.2.1   Teach Your Children Well (TYCW) programme

Results from the study by Flynn et al[33] revealed that post-intervention scores on the Sentence Comprehension sub-scale were significantly higher for foster children who received the TYCW direct instruction tutoring (*M* = 103.22, *SD* = not reported) than for foster children in the wait-list control (*M* = 98.69, *SD* = not reported) after baseline test scores were controlled, *t*[62] = 1.85, *p* = .035, 1-tailed. The reported effect size was Hedge's *g* = 0.38, which was considered to be a substantively important effect. An improvement of .38 standard deviations above the mean in Sentence Comprehension test scores translated to an improvement index of 14.8 percentile points. In terms of practical significance, this means the average student in the control group (with a test score of 100) could expect to increase 14.8 per cent in percentile rank, from the 50th

percentile to the 64.8th percentile of students if he or she had received the TYCW intervention. In other words, 64.8 per cent of primary school children in the TYCW intervention scored above the control group mean.

The post-test scores on the Math Computation sub-scale were also significantly higher for primary school children who received the TYCW direct instruction tutoring (M = 92.10, SD = not reported) than for primary school children in the wait-list control (M = 86.30, SD = not reported) when controlling for children's baseline test scores, t[62] = 2.43, p = .009, 1-tailed. A substantively important effect size was reported for the tutoring programme, g = 0.46, which translates to an improvement index of 17.7 percentile points. Accordingly, an average student in the wait-list control could expect to increase 17.7 per cent in percentile rank from the 50th percentile to the 67.7th percentile of students if he or she had received the TYCW intervention.

Primary school children's covariate-adjusted post-intervention mean for Word Reading improved from baseline to post-intervention in the TYCW tutoring intervention, however, the improvement was not statistically significant when compared to the covariate-adjusted post-intervention mean scores for children in the wait-list control t[62] = 0.90, p =.19, 1-tailed. The reported effect size of g = 0.19 was below the threshold considered substantively important and the improvement index was small (3.6 per cent), with the average primary school child in the tutoring group performing at the 53.6th percentile.

Although the covariate-adjusted post-intervention mean score on the Reading Composite subscale for children in the intervention was at the level of a trend, it did not differ in a statistically significant way from the covariate-adjusted post-test mean score for children in the wait-list control, t[62]=1.32, p = .096, 1-tailed. However, the reported effect size was substantively important (Hedge's g = 0.29) and an improvement index of 10.4 per cent meant the average foster child in the tutoring group was at the 60.4th percentile.

In contrast, the difference between the adjusted post-intervention group means on the Spelling subscale was not statistically significant and moreover children in the TYCW intervention appeared to perform worse than those in the wait-list control t[62] = −0.34, p = .74, 2-tailed. Both the effect size (g = −0.08) and the improvement index (−0.8 per cent = 49.2nd – 50.0th percentile) were very small and reflected the negative impact of

the intervention on the adjusted post-intervention mean.[33]

The study by Harper[88] conducted multilevel modelling analysis to determine whether the group-based tutoring made a greater impact on Word Reading subscale scores than the control condition at post-intervention. Results revealed that the tutoring group improved the random intercept and slope model for word reading, χ^2 (1, N = 91) = 4.99, p < .001, and the average post-intervention score on the Word Reading subscale was significantly greater for children in the TYCW group tutoring intervention than for those in the wait-list control, even when adjusted for baseline scores, which yielded a substantively important effect size, g = 0.40. The improvement index was 15.5 per cent (e.g., 65.5th – 50th percentile) meaning the average participant in the tutoring condition was at the 65.5th percentile compared to the control group participant whose average was at the 50th percentile.

An ANCOVA model was chosen for the remaining post-intervention academic outcome analyses in favour of multi-modelling analyses, which was determined to be inappropriate possibly due to low statistical power. Pre-test WRAT-4 scores were entered as the covariate in order to control for the impact of baseline academic abilities on post-intervention academic outcomes. Results revealed there was a significant group effect on the Spelling subscale, F(1, 88) = 5.617, p = .020, 2-tailed. Adjusted marginal means showed that primary school children in the TYCW group tutoring intervention performed significantly better on the WRAT-4 Spelling subscale at post-intervention than those in the wait-list group, after baseline spelling scores were controlled. The effect size of g = 0.25 was at the cusp of what was considered substantively important and the improvement index score was 9.9 per cent (59.9th – 50th percentile) with the average primary school child in the tutoring group performing at the 59.9th percentile.

There was also a significant group effect on the Math Computation subscale, F(1,88) = 4.176, p = .044, 2-tailed. The adjusted marginal means revealed that primary school children in the TYCW group tutoring intervention performed significantly better than primary school students in the wait-list control, when pre-intervention math scores were controlled. For Math Computation, the Hedge's g of 0.34 was substantively important and the improvement index was 13.3 per cent, with the average primary school child in

the tutoring group performing at the 63.3th percentile.

No statistically significant group effect was found for the Sentence Comprehension subscale, $F(1,86) = 1.97$, *(p value not reported)*, after controlling for baseline sentence comprehension scores. Primary school children in both conditions demonstrated improvements between baseline and post-intervention assessment and although results favoured the intervention, the finding between groups was not statistically significant or practically important, $g = 0.15$. The improvement index was 6 per cent (56th – 50th percentile).[88]

3.4.3 Interventions for high school aged adolescents in OOHC

3.4.3.1 Take Charge programme

At post-intervention and the 9-month follow-up, results revealed no statistically significant difference between the GPA scores of OOHC adolescents in the Take Charge intervention and those in the 'services as usual' comparator group (statistical results were not reported by the study authors) in the study by Geenen et al.[107] Statistical analyses also revealed no significant difference between the intervention and comparator group on credits earned towards graduation, $p = .08$, ES = 0.30 at the end of the intervention. However, results revealed that students in the comparator group were significantly more likely to be behind on credits needed for graduation than those in the intervention at follow-up, $t(108) = 1.88$, $p = .03$, ES = 0.42. Descriptive data suggests that the intervention may have also had some positive impact on high school retention. Four youth in the Take Charge intervention and three youth in the comparator group stopped attending high school by the end of the study period. At the 9-month follow-up, a further two youth in the intervention and seven youth in the comparator group dropped out of high school. In sum, six youth from the intervention group and 10 youth from the control group dropped out of high school during the study period, giving the intervention a slight advantage over the comparator group.[107]

3.4.3.2 Early Start to Emancipation Preparation-Tutoring (ESTEP) programme

Findings from the ITT comparisons in the study by Courtney et al[89] revealed that no statistically significant differences ($p = > .05$) were found between ESTEP and control group adolescents at the second follow-up (approximately 24-months after baseline

assessment) on any of the standardised and self-reported academic and school performance outcomes: Letter Identification (ES = 0.10); Calculation (ES = -0.01); Passage Comprehension (ES = -0.01); GPA (ES = 0.02); grade level completed (ES = -0.03); high school diploma or GED (ES = -0.01); and school behaviour (ES = -0.05). The instrumental variable model analyses similarly found the ESTEP programme did not significantly affect adolescent's age percentile scores compared to the control group at the second follow-up. Analysis of interview data revealed the median highest grade completed by adolescents in both the ESTEP intervention and comparator group was the 10th grade (intervention: M = 10.2, SD = 0.9; control group: M = 10.2, SD = 1.0). Across the entire sample, approximately 10.4 per cent of adolescents advanced less than two grades and 23 per cent advanced more than two grade levels. The proportion of adolescents who graduated from high school was low with only one in 10 youth reporting they had graduated from high school or received their GED. During their last full semester at school, youth across both the intervention and control groups received, on average, a GPA score of 2.3 in the four core subjects assessed with grades ranging from a C (2.0) to a C+ (2.5). Adolescents self-reported moderate to low levels of school-related behaviour problems during the study period.[89]

3.5 Summary of the main results

The present review included six studies that evaluated multi-component interventions targeting individual-levels barriers to educational attainment in the OOHC population.[33, 88, 89, 104, 107, 108] No eligible studies were identified that solely evaluated the effectiveness of interventions designed to address caregiver- and system-level barriers (Section 1.3.2) to educational progress for children and adolescents in OOHC. Four of the six studies evaluating individual-level interventions reported a statistically significant improvement in intervention participant's academic skills at post-intervention when compared to controls; however the observed gains in academic skills were either not reported or sustained after the intervention period.[33, 88, 104, 108] Three of the four interventions also directly targeted caregiver's involvement in their child's educational attainment (i.e., caregiver-level barrier).[33, 104, 108] All four studies involved young children (three to 13 years) in foster or kinship care placements and utilised a sampling frame that largely excluded members of the population at higher risk of educational failure, thus limiting the generalizability of the intervention effects to all children in

similar OOHC placement settings.[33, 88, 104, 108] All four interventions incorporated a component that directly targeted children's academic knowledge and skills deficits and a component that sought to improve or manage children's psychosocial and/or behavioural functioning to enhance their engagement with the educational content and learning environment.[33, 88, 104, 108]

Two of the four studies evaluated the effectiveness of school readiness programmes (Head Start[104] and the KITS programme[108]) for improving the academic outcomes of preschool aged children (three to five year olds) in OOHC and found that study participants assigned to receive intervention services had significantly and practically better early literacy[108] and pre-academic skills[104] at the end of the intervention period than preschool children of similar age and background assigned to a 'services as usual' comparator. Although Head Start had no direct impact on preschool children's pre-academic skills at the 12-month follow-up when compared to the control condition, the programme had an indirect effect on preschool children's pre-academic skills at follow-up that was mediated by gains in positive teacher-child relationships and pre-academic skills obtained during the Head Start programme.[104] No follow-up data was reported for the KITS programme so the longer-term benefits of the programme remain unknown.[108]

Two of the four studies evaluated the TYCW direct instruction tutoring programme using different delivery formats: one-on-one tutoring delivered by foster parents[33] versus group-based tutoring delivered by student volunteers.[88] Both studies found significant results and similarly sized effects for the TYCW intervention on primary school children's academic outcomes compared to a wait-list control but on different subscales of the WRAT-4 assessment tool.[33, 88] Both studies found primary school children who received the TCYW intervention had significantly and practically higher mathematics scores on the WRAT-4 at post-intervention relative to their peers in the wait-list condition, however the findings for the spelling and the reading subscales of the WRAT-4 varied between the studies.[33, 88] When compared to controls, a significant and practical improvement was found at post-intervention for Spelling and Word Reading subscale scores on the WRAT-4 for primary school students in the group-based tutoring intervention[88] but not for children receiving one-on-one tutoring from their foster parents.[33] In contrast, a statistically significant and practical improvement in WRAT-4

Sentence Comprehension subscale scores was found for primary school students who completed the one-on-one tutoring programme[33] but not for those in the group-based tutoring.[88] Children's WRAT-4 Reading Composite scores however did not improve in the one-on-one tutoring programme,[33] an outcome that was not reported by Harper[88] in the group-based tutoring evaluation.

This review found no evidence for the effectiveness of individual-level interventions in improving the academic outcomes of high school aged adolescents (14 to 17 years of age) in OOHC with a high-risk profile. The study by Courtney et al[89] found one-on-one tutoring services delivered as part of the ESTEP programme did not significantly improve the mathematics and reading skills of high school adolescents at follow-up, when their outcomes were compared to peers in a comparator group, many of whom received similar tutoring services from alternative sources. Courtney et al[89] also found no statistically significant differences between the ESTEP and comparator groups on any of the other academic and school performance outcomes measured at follow-up including grade completion, GPA, high school graduation rates or school behaviours. Similarly, no evidence of effect was found for improvements in student's GPA scores when compared to controls in the Take Charge intervention,[107] which focused on improving the self-determination skills of OOHC youth placed in special education. Although the study did find that participants in the Take Charge intervention had significantly more credits for graduation at the 9-month follow-up than their peers in the 'services as usual' comparator the results should be interpreted with caution given the study was prone to risk of bias (See Section 3.2).[107]

Chapter 4 Discussion

4.1 Interventions for preschool aged children in OOHC

The finding that preschool children in OOHC who attended a school readiness programme[104, 108] made a significant improvement in their pre-academic skills by the end of the intervention period compared to controls is consistent with a large body of literature that indicates early childhood education programmes have a statistically significant and practical impact on the cognitive and academic achievement outcomes of preschool children.[111-115] A meta-analysis by Gorey et al[112] synthesised the results of 35 preschool experiments and quasi-experiments involving more than 18,000 children over 200 preschool sites to examine the effects of early childhood education on measures of intelligence, academic achievement, school performance and other indices of personal and social success. The study found that early childhood education interventions had a large and statistically significant and positive effect on standardised measures of intelligence and academic achievement. For example, at follow-up, 75 per cent of children who participated in an early childhood programme scored significantly higher ($p < .05$) on standardised measures of intelligence (76 per cent) and achievement (78 per cent) than the average child in the control group. Notably, high intensity preschool interventions had a very large and statistically significant effect on children's intelligence (74 per cent) and achievement (80 per cent) even five to 10 years later, with seven to eight out of every 10 preschool children performing significantly better than the average child in the control who did not experience an intensive preschool education. High intensity was defined as six to eight hours of intervention sessions per day, five days a week, with a very low teacher to child ratio (1:3 to 1:6). Children who had attended an early education programme also experienced significantly lower adverse long-term personal and social outcomes (e.g., school drop out, welfare dependence, unemployment, poverty, criminal behaviour etc.) over a 10 to 25 year period compared to children who had not.[112]

In a more recent meta-analysis, Camilli et al[113] pooled and analysed the findings from 123 comparative studies to assess the impact of early education programmes on preschool children's cognitive outcomes (intelligence, school readiness and academic

achievement such as reading, writing, spelling, and verbal development, mathematics), school progress (school grades, academic track, special education placement, high school completion and college attendance), and social-emotional outcomes (self-esteem, school adjustment, educational aspirations, and aggressive or antisocial behaviours). The analysis found significant effect sizes in the cognitive domain (ES = 0.231) and to a lesser extent on school (ES = 0.137) and social outcomes (ES = 0.156) for children who attended an early childhood education programme prior to kindergarten compared to those who did not.[113]

There is general agreement that benchmarks used to understand the magnitude of effect sizes (i.e., small, medium, large) should be interpreted with reference to the discipline or domain in which they were undertaken and special consideration should be given to specific factors such as the population, intervention and context.[116] In relation to this, Pears et al[108] reported that the analysis of the KITS programme resulted in an effect size for early literacy skills (ES = 0.26) that was comparable in magnitude to the median effect size reported by Cooper et al[117] (ES = 0.19) who published a meta-analysis and narrative review examining the effectiveness of remedial summer programmes on the knowledge and skills of general population and at-risk students (i.e., children underachieving or failing due to learning disabilities, emotional/behavioural problems, physical or mental impairments). Similarly, results from the study by Lipscomb et al[104] revealed that Head Start had a direct impact on the pre-academic skills of preschool children (ES = 0.16) in OOHC at post-intervention (after 12-months of Head Start) that was comparable to the effect size observed for those in the larger sample of preschool children in the Head Start Impact Study[109] on the same outcome (e.g., ES = 0.19). It is a particularly positive finding that the pre-academic skills of preschool children in OOHC appear to have improved to a similar degree as the pre-academic skills of those in the broader population of socioeconomically disadvantaged children eligible for Head Start given that children in the OOHC subsample exhibited higher rates of cognitive and developmental delay, psychological and behavioural problems, special needs and home instability, which placed them at higher risk of academic failure.[104]

Although the effectiveness of early childhood education programmes for improving the immediate and long-term cognitive development of preschool children has largely been

established, programme quality and the magnitude of treatment effects depends upon multiple factors, including the differential impact of implementation, intervention and population characteristics and the combination of these on examined outcomes.[113, 118] Both the KITS programme[108] and Head Start[104] shared some common features that may explain the positive effects each intervention had on study participant's pre-academic skills at post-intervention. First, apart from directly targeting children's pre-academic skill deficits, both interventions targeted concomitant psychosocial vulnerabilities known to impede educational progress and place preschool children in OOHC at heightened risk for poor school performance.[104, 108] For example, the KITS programme[108] targeted and made a positive impact on preschool children's self-regulatory skills (ES = 0.18) while participants in the Head Start programme made positive gains (ES = 0.30) in the quality of their teacher-child relationships.[104]

Notably, the positive impact of Head Start on teacher-child relationship quality detected in the subsample of children residing in OOHC[104] was not observed for the full sample of preschool children taking part in the larger Head Start Impact Study.[109] Lipscomb et al[104] suggest that Head Start's whole of child approach to addressing disadvantage and the standard of teacher qualifications (60 per cent of teachers had at least a postsecondary degree)[109] possibly facilitated higher quality teacher-child relationships, which may be of unique importance to children in OOHC who typically struggle with socio-emotional development and the formation of positive relationships.[119] Converging evidence suggests that early teacher-child relationships are important for the development of children from high risk families[120, 121] and are key determinants of children's academic functioning in preschool and primary school.[122-124] A review of the evidence base for preschool education conducted by Yoshikawa et al[114] concluded that one of the most important aspects of quality in preschool education is the positive, emotionally supportive and stimulating interactions between teachers and their students. Preschool children's experiences of early childhood education programmes are also highly influenced by the relationships they form with their teachers[125] and teacher's positive expectations of academic performance have been found to have a substantial influence on student's academic achievement.[126] Indeed, Lipscomb et al[104] found that the development of positive teacher-child relationships together with gains in pre-academic skills during the Head Start programme mediated improvements

in student's pre-academic skills at follow-up (12-months later), highlighting the potentially important role that teachers play in facilitating improved academic outcomes for preschool children in OOHC. The finding that Head Start had a greater impact on the quality of teacher-child relationships for the subsample of preschool children living in OOHC than the overall sample of preschool children in the Head Start Impact Study[109] supports Sameroff's compensatory hypothesis, and research studies that suggest children at greater risk of educational failure are more likely to derive benefits from high quality early childhood programmes than those with lower risk profiles.[127-129]

In contrast, the KITS programme targeted children's pro-social behaviour and self-regulatory skills.[108] Although the intervention did not have a statistically significant effect on preschool children's pro-social skills at post-intervention, a significant and positive effect on children's self-regulatory skills (ES = 0.18) was found at the end of the study, when variance for covariates and baseline self-regulatory skills were controlled.[108] Self-regulation encompasses a capacity for inhibitory control and behavioural and emotional regulation, and amongst preschool children demonstrates an ability to perform such tasks as handling frustration and disappointment, following multistep directions, controlling impulses, focusing one's attention, sitting still, and waiting for one's turn.[108] Self-regulatory skills are increasingly being considered important constituents of school readiness programmes for early learners[108] and scholars argue that improving the self-regulatory skills of children in OOHC is of particular importance given this population's difficulty with exhibiting such behaviour.[46, 130] Research has found self-regulatory skills are positively associated with early academic ability and achievement in preschool children at-risk for learning difficulties[131, 132] and Pears et al[108] highlight the significant improvements in academic outcomes observed by the KITS programme are consistent with the findings of previous research studies that have also reported positive academic outcomes with interventions that targeted self-regulatory and academic skills in tandem.[133, 134]

Another known barrier to academic achievement for children in OOHC is a lack of caregiver involvement in their child's education and/or a lack of expectation by caregivers that their child will succeed academically[22, 23, 64, 95] (see Section 1.4.2). Greater involvement by caregivers in their children's education as well as higher levels of caregiver expectations for their child's academic performance have been positively

associated with academic success amongst children in OOHC.[135] Both the KITS and Head Start programme targeted this barrier through the inclusion of an intervention component that emphasised and promoted caregiver involvement in their child's educational development and learning.[104, 108] For example, the KITS programme taught caregivers how to develop their children's early literacy skills, how to structure their routines around school activities, and how to apply behaviour management skills.[108] Similarly, a vast array of family-related services were provided to caregivers in the Head Start programme including the provision of training in parenting skills to support their children's educational development.[104, 109] Parenting and caregiver focused components have been recognised as an important complement to preschool education programmes and found to produce additional gains in cognitive related domains.[114]

The KITS programme[108] comprised a number of intervention components associated with effective early childhood education interventions that may help to elucidate how the programme was able to make a positive impact on preschool children's pre-academic skills within it's relatively brief study period (i.e., eight weeks). First, participants received the intervention curricula as intended. Trained coders observing *in vivo* or videotaped sessions reported that 98 per cent of curriculum components were covered.[108] Given the KITS programme[108] was implemented with high levels of fidelity increases our confidence that a positive relationship between programme implementation and intended programme outcomes was achieved. Participant attendance at intervention sessions was also high with children participating on average in 74 per cent of the school readiness sessions available to them.[108] High participation in intervention sessions ensures intensity of instruction is maintained and the impact of the intervention on measured outcomes is maximised.

Another factor that may have influenced the positive effects observed in the KITS programme is the use of explicit teacher instruction.[108] In their systematic review and meta-analysis Camilli et al[113] found that preschool programmes with a direct instruction component had an immediate impact on children's cognitive development. Direct instruction contrasts with what Camilli et al[113] refer to as inquiry based educational activities, which primarily involve hands-on, student directed learning. Camilli et al[113] also discovered that positive academic gains were observed in programmes where

teachers used more developmentally appropriate strategies leading them to conclude that teacher directed or explicit instruction, rather than direct instruction in its strictest sense, is associated with programmes that produce a positive impact on student's cognitive outcomes. A previous systematic review examining the effectiveness of early childhood education programmes similarly found that cognitive outcomes were the greatest for interventions that employed a direct teaching component.[111] Findings from these reviews support the approach used in the KITS programme where skills were reportedly taught using a combination of teacher led instruction, role-playing and activity-based intervention.[108] The relatively high teacher to child ratio (1:4 to 1:5) and small group instruction format employed by the Pears et al[108] study are also supported by the evidence.[112] Research has found that smaller group sizes and lower staff to child ratios allows teachers to determine children's developmental needs and to individualise their instruction accordingly, which in turn facilitates children's engagement with the content and provides them with opportunities to practice newly learnt skills.[113, 136]

Given the large number of Head Start sites involved in the programme evaluation, children's experiences of Head Start were reported as being highly variable and the limited description of the components that comprised the programme[104, 109] made it difficult to determine how instructional time was utilised and which aspects of the intervention potentially contributed to the treatment effects observed. Notwithstanding this, it is well known that Head Start seeks to support both the family and the individual child through the provision of a range of comprehensive services that not only seek to address children's educational needs but their health, nutrition and family-related requirements as well.[109] Conventional wisdom supports the provision of additional services, which are often considered an important part of effective early childhood education programmes.[113] Lipscomb et al[104] posit that children in informal OOHC may be particularly responsive to the wrap-around services and additional supports provided by programmes like Head Start given the population's high-risk profile and their lack of access to such services.

Despite the obvious benefits that such services may confer, the results of the meta-analysis by Camilli et al[113] found that the provision of additional services had a strong and negative impact on children's cognitive outcomes. In other words, children who

attended programmes that provided comprehensive services did not perform as well academically as children who did not receive them. The provision of additional services was also negatively associated with direct instruction, which had a significantly positive impact on preschool children's academic outcomes. These findings however, were not consistent across all programmes. For example, Camilli et al[113] found that although children in the Abbott preschool programme[137] received a range of additional services, findings revealed that intervention participants made substantial gains in language, literacy and mathematics that were sustained throughout the kindergarten year.

In light of this, Camilli et al[113] suggest the provision of additional services in of themselves may not directly have a negative impact on children's academic outcomes, but rather across some programmes, resources that would otherwise be directed solely toward ameliorating children's academic deficits are instead distributed across multiple areas of service provision, potentially reducing the intensity of instruction that children receive and diluting the impact of the intervention on measures of academic achievement. Indeed, the results of the meta-analysis by Camilli et al[113] found that children who received additional services tended to receive less direct instruction in larger groups and also received preschool for longer periods of time.[113] The provision of additional services and the delivery of educational content in larger group sizes is a common feature of Head Start programmes[109] and may explain how the intervention, despite it's extended duration, produced a relatively smaller impact on children's pre-academic skills than the KITS programme, which was shorter in duration but focused solely on addressing children's social and academic deficits in a smaller group format.[108] It should be noted however, that while additional services such as those offered by Head Start may adversely impact on cognitive outcome domains, their implementation was positively associated with improvements in preschool children's social development in the meta-analysis by Camilli et al.[113]

The finding that academic gains acquired by OOHC children during the intervention period were not sustained at follow-up in the Head Start programme[104] is congruent with a number of previous evaluations of early childhood programmes, which have found improvements produced during the intervention period typically wane over time.[112, 114] Despite these seemingly disappointing findings, evidence from longitudinal evaluations of intensive small-scale programmes, as well as previous trials of Head

Start, indicate that a long-term statistically significant and practical benefit still occurs across a range of important social outcomes such as high-school graduation, years of education completed, intelligence, academic achievement, income and reduced criminal involvement and teen pregnancy, even after initial gains obtained by programme participants during the intervention do not statistically differ from controls after the intervention period.[112, 114] Yoshikawa et al[114] suggest that one strategy to help ensure short-term gains produced by early childhood education programmes are sustained past the intervention period is to design and implement high quality preschool education programmes that are composed of components and approaches supported and informed by the evidence base. Systematic evaluations examining the long-term benefits of early childhood education programmes support this notion with results from these reviews suggesting that higher quality and more intensive programmes typically have larger and more enduring treatment effects on children's cognitive outcomes, which tend not to fade much with time.[111-113, 115]

In summary, findings from this review suggest that short-term, intensive interventions that are found to be effective in improving the academic deficits of preschool aged children in OOHC may be a potentially promising alternative to interventions of longer duration that focus on addressing multiple areas of disadvantage. Although children in informal OOHC may undoubtedly benefit from the provision of additional services offered by programmes such as Head Start, children in formal OOHC are likely to already receive wrap-around services and supports that address multiple areas of need and disadvantage through the state child welfare department. Accordingly, programmes such as the KITS intervention, which are specifically designed for implementation during the summer services break when knowledge gaps commonly compound may offer a promising model of instruction for children in OOHC.[108]

It should be noted however, that the findings of Head Start, a pragmatic randomised trial of a large, well-established and comprehensive, multi-site early childhood programme, which provides a vast array of services across multiple domains of welfare[104] cannot be directly compared to the findings of a considerably smaller, narrowly focused research study such as the KITS programme.[108] The KITS intervention[108] was designed and implemented within the tightly controlled confines of a research study and therefore more accurately reflects an efficacy trial conducted

under largely ideal circumstances. In contrast, the Head Start programme was evaluated in response to a government mandate that sought to determine the average impact of the programme across a range of sites and consequently better reflects the magnitude of effects that may be expected from a programme implemented in a real world setting.[104, 108]

Methodological limitations may also have played a part in influencing the magnitude of the treatment effects observed across both studies. For example, in the study by Pears et al,[108] the inclusion of caregivers' assessment of their child's reading skills in the composite score for early literacy skills may have introduced detection bias that superficially inflated the overall outcome score for early literacy in favour of the intervention. Moreover, the pragmatic nature of the Head Start trial made it susceptible to implementation challenges that included violations of the treatment protocol that can dilute the impact of the intervention on measured outcomes.[104]

4.2 Interventions for primary school aged children in OOHC

The positive findings from both studies evaluating the TCYW programme suggest that individualised, structured, direct instruction tutoring delivered by trained volunteers may be a potentially promising intervention for improving the academic outcomes of primary school students (six to 13 years) in foster and kinship care.[33, 88] Although each study reported positive results across a different set of WRAT-4 subscales,[33, 88] taken together these findings lend further support to existing evidence that direct instruction tutoring is an appropriate and effective model for improving the academic outcomes of young people at-risk of school failure.[138, 139]

The significant improvement in literacy skills produced by the TCYW direct instruction tutoring programme across both studies[33, 88] corroborates with the previously published findings of a meta-analysis and systematic review conducted by Ritter et al[83] to assess the effects of volunteer tutoring programmes on the academic outcomes of primary school children in the general population. Notably, the meta-analysis included studies that utilised parents as tutors, as did the study by Flynn et al,[33] and studies that utilised tertiary student tutors comparable to the university students used in the study by Harper.[88] The meta-analysis pooled the findings of 21 RCTs and found that volunteer tutoring interventions made a significant impact on measures of Reading Global, Letters

and Words, Oral Fluency and Writing.[83] The effect size of the TYCW group-based tutoring on Word Reading ($g = 0.40$)[88] corresponds with the mean effect for Reading Words and Letters ($g = 0.41$) reported by Ritter et al.[83] The positive but non-significant effect of the TYCW one-on-one tutoring[33] on Reading Composite ($g = 0.29$) was also similar to the effect found by Ritter et al[83] for Reading Global ($g = 0.26$). Furthermore, the statistically significant impact of the TYCW one-on-one tutoring[33] on Sentence Comprehension ($g = 0.38$) was considerably larger than the positive but non-significant mean effect found by Ritter et al[83] for Reading Comprehension ($g = 0.18$). In contrast, a statistically significant impact on Math Computation was produced by both the TYCW one-on-one tutoring, ($g = 0.46$)[33] and the TYCW group-based tutoring, ($g = 0.34$)[88] that was larger than the positive but non-significant mean effect ($g = 0.26$) reported by Ritter et al[83] on the math scores of children in the general population.

The observed difference in findings for mathematics between the Ritter et al[83] study and those conducted by Flynn et al[33] and Harper[88] could be related to the different populations sampled (general population versus OOHC children) or influenced by the ceiling effect, which suggests individuals with good initial mathematical skills are less likely to make greater gains over the course of an intervention simply because they have less room to improve, as opposed to children with greater initial deficits. Consistent with this theory, children in the Harper[88] study were found to possess very low mathematics skills at study entry while children in the Flynn et al[33] study performed worse on the WRAT-4 Math Computation subscale than on any other academic measure at baseline. Other studies examining the effects of interventions in improving the academic outcomes of at-risk children have made similar discoveries.[140, 141]

Another possibility as to why study participants in both TYCW interventions made a significant improvement in math scores compared to those in the Ritter et al[83] study could be due to the consistent application of the math instruction, which was delivered via a self-contained and self-paced, computer-based programme rather than by the tutors themselves.[33, 88] A systematic review by Li et al[141] that pooled the results of 46 primary studies examining the impact of computer technology on the mathematics education of school aged children (kindergarten through to high school) found that computer technology had statistically significant positive effects on the mathematics achievement of students, particularly those in elementary school (i.e., primary school)

and notably, computer technology had a larger impact on the mathematics achievement of special needs students than it did on their peers in general education classes.[141]

The observed improvement in post-intervention math scores in studies by Harper[88] and Flynn et al[33] is surprising given that less time was devoted to the math-related training component of the programme in the group-based tutoring intervention[88] and it was rated less favourably by caregivers than the reading-related training and materials in the one-on-one tutoring intervention.[33] Despite this, the finding that OOHC children made practical gains in math scores across both studies[33, 88] is especially positive in light of research that indicates children in OOHC typically struggle to do well in math related domains[5, 19, 28] and the "important role that early numeracy skills play in later math achievement for students in elementary and middle school."[83 p24] Moreover, a self-paced, computer-based programme such as the one used in the TYCW programme, which can be delivered in a home-based setting with minimal supervision, is a potentially simple, cost-effective and accessible strategy for remediating gaps in mathematical knowledge in the OOHC population.[33, 88]

The finding that Harper[88] and Flynn et al[33] observed significantly positive results for a different set of academic subtests on the WRAT-4 achievement scale suggests that implementation, intervention or population characteristics unique to each study may have influenced the measured outcomes differentially. Although the reasons for this are unclear some speculation is possible. For example, group-based tutoring[88] may have facilitated better spelling and word reading in students while one-on-one tutoring[33] may have provided participants with a better opportunity to develop their sentence comprehension.

Sentence comprehension is considered to develop from the act of reading and describes the ability to comprehend or construct understanding from text.[142] Of the 3-hours dedicated to tutoring instruction in the one-on-one tutoring intervention, foster parents were required to deliver 2-hours of direct reading instruction to their foster child and 30-minutes was allocated for children to read aloud to their caregiver or another adult.[33] Research has found that reading aloud is an effective method for promoting and improving children's reading and literacy skills[143] and interventions focused on teaching reading comprehension to primary school children have been found to

produce large effects.[82] Research also indicates that one-on-one tutoring is effective for improving the reading performance of struggling readers as it helps students to engage and focus more intently on reading practice, allows tutors to tailor their instruction to the unique needs of the reader, and provides many more opportunities for tutors to deliver immediate, individualised feedback than what a small group format can provide.[144, 145] Furthermore, one-on-one tutoring allows tutors to apply scaffolded instruction that involves generating questions, summarising text, clarifying word meanings and confusing passages, and making predictions on what is to be read - all strategies that have been found to promote sentence and reading comprehension in students at-risk of reading failure.[146, 147]

Several other factors may account for the differences observed on the WRAT-4 reading subtests across the two studies.[33, 88] For example, the differential findings may reflect the intensity of instruction children received and variation in how the reading component of the programme was delivered. The group-based tutoring sessions in the Harper[88] study lasted an hour less per week than the one-on-one tutoring sessions[33] and it was unclear from the information reported what content was covered during this time. Harper[88] also reported that implementation fidelity data showed university tutors had poorly managed the focus of the content that was delivered and that a lack of adequate training in how to report fluency checks made it difficult to ascertain which tutors had implemented the programme with high fidelity. Harper[87] suggests that this may have reduced the dosage or balance of skills taught in each tutoring group and affected the results observed.[88] Despite this, the university student tutors in the group-tutoring sessions[88] received twice the amount of training on how to deliver the intervention to students than caregivers: student volunteer tutors received two full days of training prior to working with study participants as opposed to the 6-hours administered to foster parents in the study by Flynn et al[33] and also had a higher level of formal education - two factors that may have influenced content delivery and receipt. While research examining the effectiveness of tutoring programmes suggests that the type of volunteer tutor (parent versus tertiary student) does not seem to impact upon the effectiveness of a tutoring intervention, evidence stemming from such reviews has found that tutors are more successful if they receive more intensive training during their participation in a tutoring program.[82, 148, 149] In short, university students in the group-based tutoring

intervention[88] may have been more proficient tutors and focused more on the provision of instruction conducive to the development of children's word reading and spelling skills rather than their sentence comprehension.

In the study by Flynn et al[33] implementation fidelity checks indicated that 23 per cent of children who completed the TYCW intervention received a low level of treatment fidelity in reading. In other words, the reading component of the intervention was not implemented in an accurate or consistent manner. Idiosyncratic implementation of the intervention may help to explain why children in the one-on-one tutoring intervention did not make significant gains on measures of spelling or word reading.[33] Numerous research studies have demonstrated that high implementation fidelity is strongly correlated with larger effect sizes and intervention outcome effectiveness.[150] For example, Greenwood et al[151] conducted a study to examine how specific variations in the implementation of a class-wide peer tutoring intervention impacted on student outcomes. Five volunteer primary school teachers participating in the study delivered the intervention with varying levels of fidelity. The results indicated that teacher's differential application of the intervention impacted upon student outcomes with lower gains in spelling achievement reported for students who received the intervention with low fidelity.[151] However, given that no implementation fidelity data was reported in the Harper[88] study, and both studies utilised self-reported measures of implementation fidelity susceptible to social desirability bias, it is difficult to say with confidence whether the intervention components directly impacted on the observed outcomes.[33, 88]

Sample characteristics may have also influenced the observed difference in treatment effects on sentence comprehension between the two studies.[33, 88] Although both studies were conducted in Canada and the sampled populations were similar in terms of age, school grade level and OOHC placement setting,[33, 88] the majority of children in the Harper[88] study were of indigenous background. A study by Babaee[152] reported that approximately 20 per cent of Aboriginal people in Canada speak their ancestral language, with English as their second or additional language. Although the remaining 80 per cent of the population speak English or French as their first language, it is often referred to as Indigenous English as it varies from the Standard English taught within the school system. Consequently, many Aboriginal students face language related difficulties within the Canadian education system.[152] In contrast, the Flynn et al[33]

study had a predominantly European-American sample and children who did not speak fluent English were excluded from the study. Few Aboriginal students were represented which was a noted limitation of the study[33] given their overrepresentation in the OOHC population in Canada.[153] In light of these findings, it is possible that students in the one-on-one tutoring intervention[33] had better language proficiency than the predominantly Aboriginal sample of students in the group-based tutoring intervention,[88] who may have struggled more with sentence comprehension tasks.

Finally, both studies excluded children that were deemed to have insufficient behavioural control to participate in the intervention.[33, 88] As this determination was ostensibly made on a subjective basis, both populations cannot be accurately compared on this factor. However, it could be assumed that children participating in a group-based tutoring session would require sufficiently more self-regulatory skills and behavioural control than those receiving one-on-one tutoring. As behavioural issues are a known moderator of academic outcomes[154] it would stand to reason that if students in the group-based tutoring had fewer behavioural issues than their capacity to engage with the academic content may have been greater.

Notwithstanding the positive findings reported by both studies evaluating the impact of the TYCW direct instruction, tutoring programme on primary schools student's academic achievement outcomes, the observed improvement in children's academic outcomes in studies by Harper[88] and Flynn et al[33] reflect gains that resulted from children receiving the TYCW programme compared to an inactive control. These findings demonstrate a less robust measure of the effectiveness of the TYCW programme than if it had been evaluated against a 'services as usual' comparator, as was the case in the remainder of the included studies wherein control participants were not denied access to comparable interventions[89, 104, 107, 108] and in some cases were confirmed to have received such services.[104, 107]

4.3 Interventions for high school aged adolescents in OOHC

Both studies targeting high school adolescents in OOHC failed to make a statistically significant impact on intervention participants' academic outcomes compared to active controls who received typical OOHC services and alternative educational supports and programmes.[89, 107] Although adolescents in the Take Charge programme gained a

significantly greater number of credits needed for graduation than control participants at follow-up (9-months later) this observed improvement did not translate into gains in student's GPA.[107]

The Take Charge programme[107] was distinct from other interventions included in the present review in that it did not directly target or seek to remediate student's existing academic knowledge or skills deficits but rather sought to develop student's self-determination skills.[107] Major components of self-determination typically include goal-directed, self-regulated and autonomous behaviour.[155] The theory of self-determination is widely regarded within the field of special education as an important contributor to positive educational outcomes in children with disabilities[156, 157] with research indicating higher levels of self-determination are positively associated with an increased likelihood of post-secondary education[158] and skills that directly support academic performance.[156]

Research has also found self-determination skills are positively related with improved transitional planning, academic goal achievement[159] and quality of life outcomes in adolescents with developmental disabilities, including those in foster care.[160] The relationship between self-determination and academic performance has been well documented, however a direct causal relationship has yet to be established.[161] Although some experimental research suggests academic skills such as math productivity and spelling accuracy may be positively affected by increases in self-determination in children with cognitive disability[156] the majority of research supporting the promotion of self-determination skills in students with disabilities is based solely on correlational analyses.[107, 161]

The study by Geenen et al[107] is the first study to examine the efficacy of a self-determination intervention for improving the educational outcomes of adolescents in special education and foster care. A similar RCT to the Take Charge programme[107] entitled My Life was conducted to examine the transition outcomes of OOHC youth in foster care compared to a control group who received foster care and independent living services.[160] The My Life study found that intervention youth who received coaching in the application of self-determination skills and participated in mentoring workshops with near-peer foster care alumni significantly improved their self-

determination skills and quality of life outcomes at post-intervention and the 12-month follow-up compared with youth in the control.[160] Unlike the My Life study[160] the Take Charge programme did not significantly improve study participants' self-determination skills, which may help to explain the lack of observed improvement in student's academic outcomes (i.e., GPA) at post-intervention and the 9-month follow-up.[107] Geenen et al[107] speculate the intensity of the intervention may not have been sufficiently adequate to "activate self-determination as a longitudinal partial mediator of the effects of the intervention on the outcomes"[p93] with study participants receiving almost 33 hours in the Take Charge programme[107] compared to the 50 hours participants received in the My Life intervention.[160]

The finding the Take Charge programme[107] improved academic output (i.e., homework completion) and other proxy measures of academic performance but did not significantly improve student's GPA reflects the findings of previously conducted research examining the effects self-determination interventions on the academic achievement of student's with disabilities.[161] For example, Cobb et al[161] reviewed seven narrative and systematic reviews published since 2000 that focused on the effectiveness of self-determination interventions for individuals with disabilities across a range of outcomes. The findings revealed that self-determination interventions showed positive effects on academic productivity outcomes, as was the case in the Take Charge programme,[107] but did not appear to make a significant impact on student's academic achievement outcomes. Cobb et al[161] concluded that self-determination instructional and curricular packages were not an effective model for enhancing the academic achievement of students with disabilities and practitioners should seek out alternative models of instruction if they wish to improve the academic outcomes of this population. A meta-analysis conducted to investigate the correlation between self-determination and academic achievement in students with disabilities in post-secondary education similarly found no significant relationship existed between one or more components of self-determination and post-secondary academic achievement across the 18 studies analysed as measured by student's GPA.[162]

The lack of participant blinding to the Take Charge programme[107] raises the possibility that observed improvements across proxy measures of achievement including time spent on homework, catching-up on classes, and post-secondary and career planning,

as well as credits earned toward graduation[107] by intervention participants were a mechanism of the Hawthorne effect rather than the treatment itself. In other words, students may have made short-term improvements in their behaviour (i.e., attended more classes and spent more time on homework) because they were part of a study and aware their performance was being monitored by study coordinators. Although the Take Charge intervention ostensibly increased the number of credits students earned toward graduation, the lack of a targeted attempt to remediate or address student's existing academic deficits may also provide a simple explanation for the non-significant impact the intervention had on adolescent's GPA.[107]

In contrast to the Take Charge intervention[107] the ESTEP programme[89] directly targeted participants' mathematics and reading skills using a tutoring intervention comparable in structure and delivery to the TYCW tutoring intervention evaluated in studies by Harper[88] and Flynn et al.[33] For example, the ESTEP programme[89] delivered home-based, one-on-one and individualised tutoring to participants - as did the study by Flynn et al[33] - using tertiary student volunteers, similar to those utilised in the study by Harper.[88] As previously highlighted, research has found that certain programme features, intervention components and population characteristics can mediate and moderate the extent to which tutoring interventions facilitate student learning and achieve positive outcomes for participants.[82, 83] Given the ESTEP programme[89] featured many components associated with successful tutoring interventions such as the utilisation of trained volunteers,[83] structured tutoring sessions,[148, 149] individualised content[113, 163] and a one-on-one tutoring format[144] it stands to reason that characteristics of the sampled population may have moderated the intervention outcomes and lead to the null findings observed.

Unlike the other studies included in the present review, both the Take Charge[107] and ESTEP[89] programmes targeted OOHC children in an older age bracket. Whilst numerous reviews and meta-analyses have documented the effectiveness of tutoring programmes in improving the academic, and in particular the literacy and reading outcomes, of at-risk children in the early and middle years of schooling,[82, 83, 164, 165] considerably fewer evaluations have been conducted examining the effects of tutoring on the academic achievement of adolescents at-risk of educational failure.[166] This observation is not unique to tutoring interventions, a paucity of research with adolescent

samples exists for a range of interventions that have been commonly evaluated with adults and young children.[167, 168] A meta-analysis published by Jun et al[166] in 2010 pooled the findings of 12 studies to examine the effectiveness of tutoring interventions for improving the literacy outcomes of at-risk adolescents between 12 and 18 years of age. The results of the meta-analysis indicated that tutoring programmes may have a beneficial impact on the literacy outcomes of at-risk youth, however, the small number of included studies, the diversity and variable quality of the interventions assessed, and a moderator analysis that found the distribution of effect sizes was not normal, precluded the study authors from making a definitive conclusion about the effectiveness of tutoring programmes for improving the literacy outcomes in this population.[166] An earlier systematic review and meta-analysis by Goerlich et al[169] examined experimental evaluations of after-school programmes that combined recreation and/or youth development components with academic support services to improve a range of positive youth outcomes including academic achievement in a sample of primarily low-income minority students from poor performing schools. The review found no evidence that any particular programme was effective at improving academic outcomes as measured by student GPA scores. Standardised reading test scores showed that the programmes did not contribute to higher reading achievement for participants while the impact on grade improvement was small and non-significant (d = 0.083, p = .16).[169]

In sum, the paucity of evaluative research targeting the academic outcomes of at-risk adolescents, the inconclusive findings for the effectiveness of tutoring programmes[166] and the non-significant impact of after-school programmes[169] in improving the academic outcomes within this population, together with the null findings observed by both the ESTEP[89] and Take Charge[107] programmes in the present review, suggest that interventions seeking to remediate academic gaps in at-risk adolescents may have a more difficult task of doing so than interventions targeted at younger aged cohorts. This notion is supported by the current shifts in practice within the fields of child welfare and education towards early intervention initiatives,[1, 6] in light of growing evidence that preventative and developmental intervention is more effective than remediation later in school.[170] As previously highlighted, students who do not obtain necessary academic skills in their early years of schooling are at risk for continued educational failure[171] given that academic deficits continue to compound and widen as children progress

through the education and OOHC system.[22]

Participants' experiences of educational programmes also have implications for the effects of the intervention on examined outcomes. Courtney et al[89] report that one of the reasons youth did not participate in the ESTEP intervention was due to a lack of motivation on the youth's behalf. Adolescence is a period marked by transition wherein substantive physiological, cognitive, psychological and behavioural changes occur and important developmental tasks such as the formation of identity, the pursuit of more mature relationships, and an increase in independence from caregivers, need to be achieved.[172] Accordingly, adolescents may be considerably harder to engage in participatory processes than younger students. Factors outside the control of the intervention such as the influence of peer-relationships may compete for a young person's time and attention and hinder their capacity to engage completely with educational content. Research examining factors related to student's engagement and motivation with education and learning has found that as students transition from primary to high school their academic motivation increasingly declines and they become more extrinsically motivated, preferring to engage in tasks that lead to a separable outcome.[173, 174] For youth in OOHC, the motivation and commitment to pursue academic achievement may be further compromised by a preoccupation with their immediate future and pending transition into independence, particularly since OOHC youth typically lack family and support networks that would otherwise provide financial and emotional assistance during such a time of transition and uncertainty.[11, 89] Consequently, establishing and maintaining social networks and support, finding possible employment, establishing oneself in new living arrangements and learning new independent living skills such as housekeeping, shopping and budgeting, may seem more pressing and relevant concerns to adolescents in OOHC than academic achievement. Indeed, Geenen et al[107] report that many youth in the Take Charge programme were reluctant to identify immediate educational goals preferring to focus on post high school life such as finding employment. Such concerns were also reflected in workshop topics selected by participants, which included careers, transportation and relationships.[107] While the ESTEP tutoring programme's principal aim was to improve youth's reading and mathematics skills, as an independent living programme it also sought to affect a broad range of other outcomes such as self-sufficiency, employment

and housing in light of youth's pending emancipation from OOHC.[89]

Also, as the ESTEP programme was focused on addressing student's broader academic needs rather than being associated with student's school obligations such as school homework and assignments, Courtney et al[89] posit that tutors may have had a difficult time engaging youth in the tutoring sessions if youth perceived little relation between tutoring sessions and the educational content being delivered in school. This notion is supported by research which has found older students typically believe school learning activities are unpleasant, time consuming and lack direct or personal relevance to their lives; however, are more inclined to expend effort and achieve more when lessons are perceived to hold personal importance or relevance.[175, 176] Accordingly, studies have found that tutors who collaborate with student's teachers[177, 178] and coordinate tutoring content with classroom instruction maximise the effectiveness of tutoring programmes.[148, 149] These findings may explain why a large proportion of youth in both the ESTEP intervention (approximately 33 per cent) and the control group (60 per cent) sought tutoring from alternative sources and predominantly from school based tutoring programmes.[89]

Another factor that may have adversely affected adolescent's engagement and participation in the ESTEP tutoring programme is the long delay between the time of referral to the programme and the commencement of tutoring services, with youth waiting an average of 15 weeks before their first meeting with an ESTEP tutor.[89] Although enrolment in the ESTEP programme was high student's interest in the programme and its potential benefits may have waned over time and prompted participants to withdraw from the study or seek out tutoring services elsewhere.[89] The most commonly cited reason youth failed to participate in tutoring services however, was tutors inability to contact youth at the home listed on their referral form.[89] The lack of home stability, common for so many children in OOHC,[26, 179] meant that many youth who enrolled in the programme could no longer be reached at the time of programme commencement because they had changed placement settings or living arrangements between the time of service referral and programme initiation.[89]

Unlike some of the other included studies[33, 104, 108] neither the ESTEP[89] nor the Take Charge programme[107] included a component that specifically targeted caregiver-level

barriers to OOHC children's educational attainment. In light of evidence that the OOHC system and caregivers typically provide insufficient support for OOHC children's educational development and commonly underestimate their academic capacity,[22] engaging caregivers to take a more active role in their child's education is a potentially critical component of interventions seeking to target the academic achievement of young people in OOHC.[22, 172] University students and former care recipients in a study by Jackson et al[180] reported that having a significant adult who supported their academic advancement was the most important factor in facilitating their educational attainment. However, as Courtney et al[89] highlight, there is a widely held assumption that caregivers are appropriate role models for their children and will be inclined to actively support or participate in interventions seeking to improve their children's outcomes when in fact this may not necessarily be the case.[172] Study coordinators in the ESTEP programme identified caregivers as the greatest challenge and barrier to youth's participation in the programme: caregivers commonly refused study coordinators access to youth for follow-up interviews (i.e., gatekeeper refusals), were not available during tutoring sessions, refused to change schedules to accommodate tutoring, did not permit tutoring to commence, and some refused to transport youth to workshops.[89] Not surprisingly, the importance of obtaining caregiver buy-in and participation in interventions has been emphasised by research examining the effectiveness of interventions aimed at improving a range of positive outcomes in OOHC populations.[172] Huey and colleagues, as cited in Schmied et al,[172] caution that family members involved in intervention research need to be fully engaged otherwise their involvement may adversely impact upon study outcomes.

In sum, low levels of engagement, possibly due to a lack of structured caregiver or system-level support, competing priorities and a preoccupation with impending independence, a lack of understanding about the intervention's relevance and it's applicability to everyday life, and placement mobility, may together help to explain the large number of youth who enrolled in the ESTEP programme but failed to participate.[89] Low levels of engagement are associated with intervention dropout and withdrawal, high non-adherence to treatment protocols and low participation rates.[181] Geenen et al[107] similarly reported that youth availability accounted for much of the variation in coaching hours received. Low participation rates such as those reported in

the Courtney et al[89] study can impact upon the amount of instruction (i.e., intensity) student's receive. In the ESTEP tutoring programme, youth were allocated a maximum of 50 hours of remedial one-on-one tutoring, equating to approximately 1.5 hours per week.[89] While this level of intensity is comparable to the two hours delivered in the Harper[88] study and half the intensity delivered in the Flynn et al[33] study, ESTEP adolescents only received on average 18 hours of mathematics tutoring and 17 hours of reading over the 9-month study period, potentially diluting the impact of the intervention on study outcomes.[89] In their meta-analysis on the impact of after-school programming on youth outcomes, Goerlich et al[169] similarly speculated that the non-significant findings in 84 per cent of the included studies could be attributed to the low participation rates by youth across the studies.

The null findings in both the ESTEP[89] and Take Charge[107] programmes could also be a function of the distinguishing characteristics of the population targeted by both studies. Evaluative educational research indicates that subsets of children can experience different programme effects as a result of initial levels of attention, cognitive or academic skills, and behavioural issues.[127] While all the included studies involved children from OOHC, study participants in both the ESTEP[89] and the Take Charge[107] programmes possessed a greater number of individual-level risk factors. For example, children in the ESTEP intervention needed to be three or four years behind grade level to enter the study with many being over this predetermined threshold.[89] Additionally, eligibility criteria across both the ESTEP[89] and Take Charge[107] studies did not exclude children from group homes who typically have more behavioural issues, higher rates of developmental delay, and worse educational outcomes than children in home-based care, as did the other four included studies that observed positive intervention effects.[33, 88, 104, 108] Moreover, the Geenan et al[107] study specifically included young people in OOHC placed in special education with almost one third of all youth attending an alternative school due to emotional, behavioural or attendance issues.[107] Similarly, a substantial proportion of youth participating in the ESTEP programme had learning disabilities, participated in special education programmes or experienced borderline or clinical levels of mental health and behavioural problems.[182] The meta-analysis by Jun et al[166] that evaluated the effectiveness of tutoring interventions for improving the literacy outcomes of at-risk youth specifically excluded studies that involved students

with learning disabilities, which may account for the positive albeit inconclusive finding that tutoring programmes had a beneficial impact on the literacy outcomes of at-risk youth.[89]

The null impacts of the ESTEP programme[89] may also simply indicate that tutoring is not an appropriate model of intervention for improving the academic outcomes of adolescents who have complex academic, social, and behavioural needs – population characteristics that may impede and undermine mainstream instructional strategies. Additionally, volunteer tutors may be ill placed to address the complex set of learning disabilities, mental health and behavioural issues, and extensive academic deficits characteristic of this population.[182] A multi-component intervention designed to target these vulnerabilities and delivered by special education teachers or paraprofessionals rather than volunteer tutors, may be a more appropriate model for meeting the specialised needs of this high risk population; however, this proposition remains to be evaluated by future research studies.[182]

4.4   Limitations of the included studies

A number of key methodological and study design limitations were identified across the included studies. Inadequate reporting of study methods was a common limitation that impeded the accurate assessment of methodological quality. While a randomised control study design was employed by all studies, most did not report the type of randomisation procedure that was utilised, making it difficult to determine whether true randomisation was implemented and selection bias minimized. Given none of the studies blinded participants to the intervention, results should be interpreted with caution as Hawthorne type effects such as performance and social desirability bias may account for some of the observed post-intervention improvements particularly in studies where standardised measures were not used to assess academic outcomes, as was the case in the study by Geenen et al.[107] Only one study[108] confirmed that outcome assessors were blinded to the intervention. The use of outcome assessors with foreknowledge of participant's study assignment and a vested interest in their performance may have biased how academic outcomes were measured and improvements detected. Consequently, risk of detection bias was a major limitation across the majority of included studies, which may have superficially inflated the study

findings in favour of the intervention. Studies across the board also failed to report or address allocation concealment increasing the risk that selection bias was introduced into the study's randomisation or recruitment process. If allocation concealment is not carried out, research staff may be more likely to assign better participants to the intervention than the control, which can consequently exaggerate the estimate of the intervention effect size.

Across the majority of studies, the sample population did not adequately represent the studies target population limiting the generalisability of the study findings to the population of interest. Study eligibility criteria often biased the inclusion of population members most likely to benefit (or succeed) from the intervention (e.g., children who were in long-term or stable placements, possessed adequate cognitive capacity and exhibited appropriate behavioural control). The potential to extrapolate study findings to the target population was often further compromised by eligibility criteria that did not adequately define the sample population across a range of factors. For example, children eligible for inclusion in the Harper[88] study had to be in long-term stable placements, behind in academic achievement and able to exhibit sufficient behavioural control; however, these criteria were ostensibly determined by caseworkers and not objectively defined, making it unclear who the benefits of the study may be applicable to. As the majority of studies focused on OOHC sub-populations and typically excluded children at greater risk of educational failure within these populations (i.e., children in facility-based care) the results of this review do not readily apply to the broader OOHC population.

Studies commonly failed to report the outcomes for study participants who did not complete the intervention protocol and seldom provided sufficient detail on the reasons participants dropped out or withdrew from a study or how these participants varied systematically from those who remained in the study. In the majority of studies, an ITT analysis was not conducted to correct for bias caused by missing data and only data from subjects who completed the study protocol were analysed. Considering that subjects who do not complete the intervention protocol are likely to be at greater risk of educational failure, their exclusion from the final analyses may have biased the outcomes in favour of the intervention. The majority of RCTs utilised small to moderate sample sizes, which limited their ability to provide a convincing level of generalisable

evidence for the effects of the interventions. With regards to outcomes, half the studies focused on measuring immediate post-intervention changes and did not include a follow-up evaluation thus throwing into question whether observed benefits were sustained beyond the intervention period. As multi-site ecological experiments, the ESTEP[89] and Head Start[104] programmes were both affected by contamination bias resulting from violations of the assignment protocol the magnitude of treatment impacts on measured outcomes may have been underestimated.

4.5 Limitations of research in this field

There are numerous limitations within this field of research that should be acknowledged. Existing research syntheses indicate that evaluative research on improving the educational and school outcomes of children in OOHC is an emerging field characterised by a limited but growing number of studies.[19, 79, 80] Experimental studies assessing the effectiveness of interventions in improving the academic outcomes of children and adolescents in OOHC have only been conducted in recent times. Liabo et al[79] reported that nine out of the 11 studies included in their systematic review consisted of pilot evaluations of newly developed programmes. Much of the existing evidence base comprises evaluations of pragmatic experiments implemented in real world settings. While such studies should hold greater ecological validity, the methodological quality of the studies is typically poor. Many studies utilise small sample sizes, employ methodologically weak study designs (e.g., before-and-after studies without an adequate control) and have high loss to follow-up.[79]

The lack of high quality studies can be attributed to the infancy of the field[183] and a number of associated factors. First, the OOHC population is highly mobile, face multiple personal challenges, and are governed by a range of professionals responsible for various aspects of their care, all of which can hinder the recruitment and retainment of study participants to study trials. Second, evidence-based practice is a relatively new approach within the field of education and the social services and the use of RCTs is still highly contentious, with many maintaining that the process of withholding an intervention from a group of participants who could stand to benefit is ethically questionable.[110] Ethical concerns also surround the unnecessary testing of children classified with high needs. Third, more rigorous study designs, such as RCTs, can be

expensive to conduct and may be out of reach to the under-resourced fields of education and social work. Finally, educational interventions do not lend themselves easily to highly rigorous study designs and pragmatic trials are susceptible to many more biases than smaller research studies given that many aspects of their implementation are difficult to coordinate and control as demonstrated in the ESTEP[89] and Head Start[104] evaluations.

4.6   Limitations of the systematic review

The present review has the following limitations. Only studies published in the English language were included as resources for the translation of studies published in other languages were not available for the purposes of this review. Although a comprehensive search was undertaken across numerous databases and grey literature sources, there is a risk that potentially eligible and relevant studies may have been inadvertently omitted from this review. A single reviewer (Dagmara Riitano) screened and selected articles for inclusion in accordance with the review's eligibility criteria and performed the data abstraction increasing the risk that errors of omission and data handling error were introduced into the review. The study authors of the included studies were not contacted directly with a request to verify or provide information about certain aspects of the study design to ensure the critical appraisal of the studies accurately reflected what was undertaken. Lastly, despite the included studies sharing similar aims and objectives, a meta-analysis or pooled summary of effect estimates could not be conducted due to substantial heterogeneity across the included studies (see Section 3.2 and 3.3).

4.7   Implications for policy and practice

Policymakers and practitioners in education and social work are moving gradually toward a reliance on evidence-based information when making policy and programme implementation decisions. While this review included data solely from experimental studies considered to be the most reliable form of evidence for estimating the true effects of an intervention, the findings are insufficient to support any specific policy or practice recommendations. Notwithstanding this, practitioners seeking to provide additional services to OOHC children at risk of not meeting requisite standards in

government accountability system reforms may consider individual-level, multi-component school readiness programmes and direct instruction tutoring interventions as potential strategies for improving the academic skills of young children in foster and kinship care.

The finding that school readiness programmes had a positive impact on preschool children's pre-academic outcomes may be of particular interest to decision makers for a number of reasons. First, there is a robust literature that indicates intensive, high quality and evidence based early childhood education programmes can have a significant impact on a range of adverse long-term outcomes, which children in OOHC are at exceptionally high risk of experiencing (e.g., low education and income, criminal involvement, social welfare dependence etc.).[112] Second, strategies aimed at prevention and development rather than remediation are currently well supported given the shift in practice to prioritise the safety and wellbeing of younger children due to their increased vulnerability and greater potential for rehabilitation from early adverse life events.[1, 6, 170] Third, the implementation of early childhood education programmes is particularly pertinent given a large and increasing number of children (43 per cent in 2012/13) being admitted into the Australian OOHC system are under five years of age[1] and could stand to benefit from access to specially targeted compensatory preschool education programmes.

Evidence from this review does not support the promotion of self-determination skills to improve the academic outcomes of OOHC high school adolescents in special education and likewise the implementation of one-on-one tutoring for improving the reading and math skills of OOHC high school adolescents with high needs. Taken together, findings from this review suggest that interventions aimed at improving the academic outcomes of students in OOHC are more effective in younger aged participants who possess fewer risk factors for academic failure than in adolescents with a greater number of specialised needs. However, as study samples in the included studies were often drawn from specific geographical locations and comprised students with characteristics not representative of the targeted OOHC population, the findings from this review may not be generalisable to other OOHC populations or contexts.

Practitioners looking to implement interventions aimed at improving the educational

outcomes of children in OOHC must make nuanced decisions about the suitability of selected programmes for the targeted population and the context in which they will operate. As previously highlighted, population characteristics and participant's experiences in a programme may potentially moderate the effects of an intervention on measured outcomes. Although OOHC children collectively face multiple individual-, caregiver- and system-level barriers to educational attainment (see Section 1.3.1) the population is highly heterogeneous. Children's level of risk for academic failure depends on multiple factors (i.e., behavioural, psychological, developmental, cognitive, environmental etc.) that can impede to a lesser or greater extent their capacity to engage with academic content and their learning environment. While some children in OOHC may benefit academically from a mainstream model of instruction other children may require an intervention that provides more specialised and tailored remedial assistance. It is unlikely that one type of intervention will suit all members of the OOHC population. Indeed, the present review found that one-on-one tutoring delivered by volunteer tutors significantly improved the academic outcomes of primary school aged students in foster and kinship care, however, a very similar model of tutoring (ESTEP programme[89]) made no significant impact on the academic outcomes of high school adolescents in OOHC with a high risk profile. Given the heterogeneity of the OOHC population, practitioners should give special consideration to programmes that have been informed by the evidence and designed specifically to address the needs of the subpopulation of OOHC children being targeted.

Due to fiscal restraints, the format of an intervention, it's duration and how it is implemented will also likely need special consideration by relevant stakeholders. The present review found evidence that school readiness programmes of relatively short duration had a similar impact on the pre-academic skills of preschool students as an intervention of much longer duration. Given that interventions of extended duration, such as Head Start, typically require a greater expenditure of resources over the course of their implementation, more tailored and intensive early education programmes implemented at critical transitory periods in children's lives may be a more cost-effective alternative to remediating academic outcomes in a child welfare system that is chronically under-resourced.

The present review also found evidence that tutoring programmes can have a significant impact on children's academic outcomes using different formats, each of which has it's own strengths and weaknesses. Harper[88] argues that tutoring delivered in a group-based format is a cost-effective alternative to one-on-one tutoring, which is traditionally used with at-risk populations. On the other hand, Flynn et al[33] highlight that caregivers remain an untapped resource who can be utilised to deliver educational interventions, however do caution the one-on-one TYCW tutoring programme is "not suited to everyone and strong efforts should be made to engage only those who are motivated and able to use it well."[p1189] While caregiver involvement is considered an important component of effective programmes implemented with OOHC children,[172] it should not be assumed that caregivers will wish to participate or actively support their child's involvement in intervention programmes.[89] Given caregivers can impede programme implementation, which can adversely impact upon study outcomes,[89] practitioners should seek full engagement and buy-in from caregivers to help ensure programme success.

Although the studies included in this review targeted a small number of individual- and caregiver-level barriers, children are still vulnerable to barriers that operate at the system-level (see Section 1.3.2). Although no intervention studies were identified that targeted system-level barriers to OOHC children's educational attainment, and there is scant evidence for their effectiveness,[79, 80] policymakers should continue to prioritise policy and legislative changes that address organisational and system failings that continue to adversely impact upon OOHC children's academic outcomes given that research has found delays in educational progress are frequent even among OOHC students who are highly motivated and demonstrate academic promise.[63] Moreover, policy and decision makers should financially support the implementation and evaluation of well-designed and methodologically robust studies that can provide reliable evidence of effect.

4.8 Implications for future research

The preliminary findings presented in this review need further examination in order to better understand the potential benefits of educational interventions for children and adolescents in OOHC. Replication of the included studies is also necessary to verify the

findings observed. Given the evidence base is characterised by a large number of methodologically weak studies there is a strong need for additional high-quality outcome research.[19, 79, 80] Where possible, robust RCTs of well-defined and evidence-informed interventions should be conducted. A number of excluded studies reported that an RCT was intended but could not be implemented due to the ethical concerns of withholding an educational programme from high-needs students allocated to a control condition. However, as studies in this review have demonstrated, such concerns can be circumvented by assigning participants to a wait-list control that ensures they will receive the intervention at a future date, or through the use a 'services as usual' comparator that allows control participants to receive alternative educational interventions during their participation in a study.

The paucity of high quality evidence in this area undoubtedly reflects the pragmatic, methodological and ethical challenges facing researchers who attempt to conduct and evaluate programmes within this field. The lessons and limitations experienced and reported by the preliminary evidence base can help to inform future research initiatives. Researchers should anticipate and address challenges that commonly present themselves in this field in order to minimise the limitations that can undermine the methodological quality of a study and its findings (for an overview see Liabo et al[79]).

A number of methodological limitations common to the included studies should be addressed by future studies. First, selection bias should be minimised by employing an adequate allocation concealment process that prevents study coordinators from knowing upcoming condition assignments in advance. Over-recruitment and participant retention strategies should be implemented in anticipation of high dropout and withdrawal rates that are common to studies involving OOHC children due to the population's high levels of personal instability and placement mobility. Future studies should follow-up study participants to determine whether intervention effects have sustained benefits, however, possible difficulties in reaching or engaging participants after the official study period should be anticipated in light of participant placement changes or gatekeepers (i.e., case-workers, caregivers) who may deny access to study participants or their data (e.g., school performance data). Strategies that monitor compliance and motivate participants to adhere to treatment protocols are warranted to minimise contamination across treatment and control conditions given this is a common

concern for education and social services research. All outcomes should be measured using standardised instruments with established validity and reliability rather than school performance data (i.e., GPA), which is subject to variability and may preclude comparison within and between studies. Individuals responsible for measuring performance outcomes should be blinded to treatment allocation. Studies should also attempt to draw a participant sample for the study that is representative of the target OOHC population to help ensure study findings can be generalised to other settings, however, it is acknowledged this may be particularly difficult given the heterogeneity of the OOHC population. Alternatively, study protocols should include explicit, clearly defined, and objective population eligibility criteria to help readers understand which members of the OOHC population the study results may apply to. This approach will also allow future researchers to accurately reproduce the eligibility criteria should they wish to replicate the study and can help to minimise selection bias from entering the recruitment process by preventing subjective judgements from determining participant's study eligibility.

There are numerous gaps in the research owing to the infancy of the field. The findings stemming from this review highlight areas where more research is needed. Given that implementation and intervention characteristics can impact upon the magnitude of treatment effects on measured outcomes, future research studies should seek to design interventions underpinned by theoretical frameworks relevant to the OOHC population and are composed of components that are supported by evidence for their effects. Future research should also attempt to identify key moderators and mediators that may impact on treatment effectiveness. It is unclear from the findings of this review whether population characteristics (age, academic deficits at baseline, ethnicity) or intervention components (treatment intensity, duration) impacted upon the observed effects. Furthermore, given that primary research indicates females emerging from the foster care system are more than twice as likely to achieve a bachelor's or graduate degree than males[36] future research studies should examine the differential impact of educational interventions on gender. Moderator analysis may help to identify what aspects of a programme facilitate learning for different subsamples of the population.

The present review highlighted the potentially important role that teachers and caregivers play in facilitating OOHC children's academic outcomes. Future studies

should seek to examine whether the involvement of significant others (e.g., caregivers, teachers, caseworkers or mentors) in children's education and learning is associated with greater academic gains for children in OOHC. Moreover, the finding that a self-paced, computer-based math programme was able to improve primary school student's math scores across both studies evaluating the TYCW direct instruction tutoring programme[33, 88] is a promising finding that should be explored further using experimental research.

The studies included in this review that observed statistically significant and practically meaningful intervention effects largely excluded children at greater risk of academic failure. While traditional and mainstream models of instruction may benefit children in OOHC they are likely to be insufficient to fully address the range of these children's needs.[108] More interventions are required that have been tailored to address the specific needs and barriers of children who are at greater risk of educational failure. As participants' experiences of educational programmes can also impact on study outcomes, future studies should consider integrating qualitative data collection into their study designs. Qualitative research can provide important insights into youth's acceptability of interventions, which may help to inform the design of future interventions and lead to increased engagement and participation rates by this population.

Previous research syntheses identified a number of system-level interventions that sought to improve collaboration between the educational and child welfare sectors.[79, 80] Although these studies were found to have little impact on children's academic outcomes[79, 80] there is potential scope for future studies to examine these types of interventions using more robust study designs. Future researchers could also consider developing multi-component interventions that aim to address multiple barriers to children's education progress (i.e., individual-, caregiver- and system-level barrier). For example, a tutoring intervention that is supported by an educational liaison officer who can work with various stakeholders across the child welfare, caregiving and educational environments, to ensure children's educational needs in the intervention are being well supported, may overcome some of the implementation challenges common to the field and possibly enhance the impact of the intervention on student's academic outcomes as a result. Other types of intervention models that have demonstrated promising

findings using quasi-experimental study designs (e.g., Letterbox Club, distribution of learning materials)[79, 80] should also be evaluated using experimental research so more reliable evidence about their effects can be generated.

Given the many implementation challenges that have been reported by researchers in the field, researchers should look to work collaboratively with such stakeholders from the outset of research endeavours to ensure implementation challenges that may adversely impact on the study design and its subsequent findings can be addressed and where possible minimised. System-level support and stakeholder engagement are vital to ensuring that programme implementation and evaluation circumvent possible issues such as contamination bias, difficulty accessing school records, and lack of engagement and participation by study participants etc. Addressing the educational deficits of children in the OOHC population is a long-standing problem for social services and the broader community. Governments and policy-makers worldwide have advocated for the development of interventions that can ameliorate the risk of educational failure for young people in OOHC. If such programmes are to be successful it is critical that effective treatments are developed and implemented. Educators and practitioners are well placed to collaboratively develop and implement educational interventions designed to meet the special needs of the targeted OOHC population while researchers can inform the design of these interventions and evaluate their effectiveness on policy relevant outcomes.

4.9 Conclusions

In conclusion, evidence from this review suggests multi-component interventions that directly target individual-level barriers to educational attainment can improve the short-term academic outcomes of young children in foster and kinship care. More specifically, modest evidence was found for the effectiveness of school readiness programmes in improving the pre-academic skills of preschool aged children (three to five years)[104, 108] and for direct instruction tutoring programmes in improving the mathematics and reading skills of primary school children (six to 13 years)[33, 88] in foster and kinship care. No evidence was found to support the effectiveness of interventions aiming to improve the academic outcomes of high school adolescents (14 to 17 years) in the broader OOHC population at high risk for educational failure.[89, 107]

Given the emerging state of research in the field, it is premature to make recommendations on the basis of the available research, however preliminary data from the included studies indicates that a number of interventions show promising benefits. More methodologically rigorous research is needed before firm conclusions can be made about the effectiveness of these programmes for improving the academic outcomes of children and adolescents in OOHC. Future research needs to be based on robust study designs that address key methodological limitations and challenges common to this line of enquiry. A commitment by researchers and stakeholders to conduct collaborative trials is also required to build and advance the current evidence base.

This review built on existing research syntheses[79, 80] by extending the eligibility criteria to include OOHC children of all ages and made a unique contribution to the evidence base through the inclusion of school readiness programmes that targeted the pre-academic skills of preschool children in OOHC. The inclusion of these interventions highlights an important area of research that has potentially promising application in policy and practice given current shifts in child welfare to prioritise the needs of the youngest children and to favour the implementation of prevention and development initiatives rather than models of remediation.[1, 6, 170]

The present review also contributed to our understanding of the types of interventions that hold promise for addressing some of the educational barriers faced by young people in OOHC and highlighted substantive methodological gaps in the evidence as well as critical areas for future research that may help to inform the design and delivery of future initiatives seeking to address the poor educational standing of this vulnerable population.

Appendix 1: Systematic review protocol

Review title

The effectiveness of interventions designed to improve academic outcomes in children and adolescents in out-of-home care: a systematic review protocol

Reviewers

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Review question/objective

The review question is: What is the best available evidence regarding the effectiveness of interventions designed to improve academic outcomes in children and adolescents in out-of-home care?

Background

Children and adolescents in out-of-home care (OOHC) are young people under the age of 18 years who have been removed from their homes and placed into alternative accommodation because they have been abused, neglected or identified as being at risk of significant harm.[1] OOHC is an umbrella term that encompasses different types of placement settings and is variably defined within the literature; however, the most common types of settings include foster care, relative or kinship care and therapeutic residential care. [1]

Internationally and nationally, the number of children entering OOHC is increasing dramatically. In Australia, a record of 12,240 children entered out-of-home care in 2011-12 and at 30 June 2012, there were 39,621 children in out-of-home care, a rate of 7.7

per 1,000 Australian children. [1] The responsibility of statutory child protection within Australia lies with state and territory governments who financially support the placement of young people in OOHC and are tasked with ensuring their safety, welfare and healthy development until adulthood.

Given the serious effects of maltreatment on wellbeing, efforts to help young people in OOHC to reach their potential have focused primarily on strategies that are therapeutic in nature. Considerably less attention and resources have been directed towards interventions that improve academic and school outcomes in this population, despite numerous studies that indicate significant disparities in educational attainment between young people in OOHC and their peers in the general population.[2,3] For example, foster cared children have been found to perform worse than non-foster care peers with similar cognitive abilities, [4] and are also less likely to perform well in reading and mathematics. [5] Research has also found that twice as many foster children and adolescents repeat a grade in both primary and secondary school than their peers who are not in care.[6,7] Not surprisingly, research findings consistently indicate that children living in OOHC are at high risk for school failure. Young people in foster care graduate from school at lower rates than their peers, [8] and fewer go on to secondary and post-secondary education compared to peers with similar cognitive capacity and compared to peers with similar school achievements in primary school.[9] Those students that do proceed to post-secondary education graduate at a slower rate than their non-foster care peers.[10] In summary, these findings suggest that many children in OOHC perform below their capacity and potential.

A number of factors have been attributed to the low educational status of children in OOHC. First, young people entering care placements often present with a range of emotional, psychological and behavioral problems as a result of their complicated histories and negative early experiences, which can adversely affect their confidence and ability to perform academically. Unfortunately for some children in OOHC, experiences of trauma and neglect can also have a negative impact on their normal development that result in delays and deficits in cognitive functioning. For example, research indicates that up to 65 per cent of maltreated children demonstrate cognitive delays, [11] and up to 64 per cent demonstrate speech and language delays.[12] Consequently, many of these children exhibit significantly lower scores on tests of

cognitive functioning than their non-maltreated peers.[13] Second, because a majority of this population exhibits behavioral problems in the classroom, they are significantly more likely to be suspended or expelled from school and have higher rates of absenteeism than children in the general population.[14] Together with placement instability and disruption, or multiple school placements or changes, many children and adolescents in OOHC spend extended periods of time away from school, which has an adverse impact on the continuity of educational instruction received and consequently educational attainment and school performance.[15]

It is well established in the literature that low levels of educational attainment can have a serious negative impact on a range of long-term outcomes. Young people not provided with adequate educational attainment during their school years will be ill equipped to move into independent living, which can start as early as 16 years of age in Australia, and become at risk for serious disadvantage for securing employment and acquiring the social supports and economic benefits that come from being part of such a network. Numerous studies indicate that low levels of education have been associated with long-term unemployment (or a lack of employability), social isolation, adverse health outcomes and psychological wellbeing[16] even after controlling for birth parents' characteristics, time in care and age at placement.[17]

A recent scoping review found that research on interventions designed to improve academic achievements in children in OOHC is limited. [9] However, results from this preliminary examination of the evidence found positive findings for the majority of interventions included in the review, highlighting that the academic achievement of children in OOHC can be improved. For example, the review found that tutoring programmes, distribution of learning materials and tailored individualized support or the use of an education liaison all had a positive impact on school performance within this population.

The proposed systematic review seeks to build on the findings of the scoping review by conducting of a comprehensive search of both the published and grey literature surrounding this topic and through a quality assessment of the included studies. In doing so, it aims to inform further research, policy and practices in the field. Improving academic and school outcomes within this ever increasing population is critical to this

population's long-term health and wellbeing as adults.

Keywords

Out-of-home care; OOHC; alternative care; foster care; kinship care; welfare; children; adolescents; youth; education; academic; learn*; school; literacy; read*; skills; achieve*; perform*; mentor*; tutor*; intervention; strateg*; program*; support

Inclusion criteria

Types of participants

This review will consider studies that include children and adolescents (under 18 years of age) placed (currently or formerly) in out-of-home care (OOHC). As the terminology for OOHC varies within the literature, this review will take an inclusive approach by including any placement setting that falls within the study's definition of OOHC or according to the jurisdiction in which the study was undertaken. Examples of placement settings include: foster care, kinship care, group home, or residential care.

Types of intervention(s)

This review will consider studies that evaluate interventions designed to improve academic or school outcomes in children and adolescents in OOHC as defined below. Eligible interventions may include but are not limited to: tutoring programmes, individualized educational support, education liaison, reading intervention programmes, etc.

Types of outcomes

This review will consider studies that include at least one of the following outcomes:

Primary outcome (academic outcomes):
- Achievement or performance across a range of academic areas (reading comprehension, spelling, mathematics calculation and reasoning, writing, spelling, etc.) measured with school grades, grade point average (GPA) or scores on age standardized measurements (e.g., California Achievement Test, Stanford Achievement Test, Wide-Range Achievement Test, etc.); and teacher assessments or ratings.

Secondary outcomes (school outcomes):

- Attendance rates, grade retention, disciplinary referrals, suspensions, expulsions, dropout rates and graduation rates.

Types of studies

This review will consider experimental study designs including randomized controlled trials, non-randomized controlled trials, quasi-experimental and before and after studies.

Search strategy

The search strategy aims to find both published and unpublished studies. A three-step search strategy will be utilized in this review. An initial limited search of ERIC and PsycInfo will be undertaken followed by an analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. A second search using all identified keywords and index terms will then be undertaken across all included databases. Third, the reference lists of all identified reports and eligible studies will be hand-searched to identify additional studies of potential relevance. All searches will be limited to English language publications. Given the limited evidence base and scarcity of potential studies, the search will not limit study inclusion by publication date and will be conducted from database inception to the present time.

The databases to be searched will include:

- Education Resources Information Center (ERIC)
- PsycInfo
- Social Sciences Abstracts
- Medline (PubMed interface)

The search for unpublished studies will include:

- Proquest (Dissertations and Theses)
- Google Scholar

Contact with experts and stakeholders: Experts and academics familiar with the literature and relevant organizations (e.g., The Pyjama Foundation, OzChild, Create Foundation, The Legal Center for Foster Care and Education, Casey Family

Programmes, California Child Welfare Co-Investment Partnership) in the field will be contacted by email with a request for information on any unpublished studies or copies of relevant reports of which they are aware.

Initial keywords to be used will be:
Out-of-home care; OOHC; alternative care; foster care; kinship care; welfare; children; adolescents; youth; education; academic; learn*; school; literacy; read*; skills; achieve*; perform*; mentor*; tutor*; intervention; strateg*; program*; support

Assessment of methodological quality

Papers selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments from the Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) (Appendix I). Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer.

Data collection

One review author will extract data from the studies included in the review using the standardized data extraction tool from JBI-MAStARI (Appendix II). The data extracted will include specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives. Authors of primary studies will be contacted to obtain or clarify any missing data or uncertainties regarding its interpretation.

Data synthesis

Quantitative data will, where possible, be pooled in statistical meta-analysis using JBI-MAStARI. All results will be subject to double data entry. Effect sizes expressed as odds ratios (for categorical data) and weighted mean differences (for continuous data) and their 95 per cent confidence intervals will be calculated for analysis. Heterogeneity will be assessed statistically using the standard chi-square test and also explored using subgroup analyses based on the different study designs included in this review. Where statistical pooling is not possible, the findings will be presented in narrative form including tables and figures to aid in data presentation where appropriate.

Conflicts of interest

Nil.

Acknowledgements

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Appendix 2: Search strategy

PubMed (pubmed.gov), conducted 9th December 2014

Search	Query
#1	Foster care [tw] OR foster child* [tw] OR foster home [tw] OR foster youth [tw] OR kinship care[tw] OR out of home[tw] OR alternative care [tiab] OR looked after [tiab] OR group home [tiab] OR group care [tiab] OR guardianship [tiab] OR residential care [tiab] OR public care [tiab] OR state care [tiab] OR congregate care [tiab]
#2	"Foster Home Care"[Mesh] OR "Group Homes"[Mesh]
#3	#1 OR #2
#4	Education* [tiab] OR academic [tiab] OR learn* [tiab] OR school [tiab] OR literacy [tiab] OR read [tiab] OR reading [tiab] OR math* [tiab] OR numeracy [tiab] OR spell* [tiab] OR writ* [tiab] OR graduat*[tiab] OR tutor* [tiab] OR liaison [tiab]
#5	"Educational Status"[Mesh] OR "Educational Measurement"[Mesh] OR "Psychology, Educational"[Mesh] OR "Schools"[Mesh] OR "Residential Treatment"[Mesh] OR "Caregivers"[Mesh] OR "Mentors"[Mesh]
#6	#4 OR #5
#7	#3 AND #6
	Filters: Child: birth-18 years; Adolescent: 13-18 years

PsycINFO (Ovid SP interface), conducted 9th December 2014

Search	Query
#1	(foster care or foster child* or foster home or foster youth or kinship care or out of home or alternative care or looked after or group home or group care or guardianship or residential care or public care or state care or congregate care).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
#2	exp foster care/ or exp foster children/ or exp group homes/ or kinship/ or *residential care institutions/
#3	#1 OR #2
#4	(education* or academic or school or literacy or read or reading or math* or numeracy or spell* or writ* or graduat* or tutor* or liaison).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

#5	education/ or elementary education/ or high school education/ or middle school education/ or preschool education/ or public school education/ or secondary education/ or exp remedial education/ or exp academic achievement/ or exp academic aptitude/ or academic failure/ or exp academic underachievement/ or educational measurement/ or exp educational program evaluation/ or exp educational programs/ or educational objectives/ or exp educational standards/ or exp school based intervention/ or exp school learning/ or reading education/ or mathematics education/ or spelling/ or reading skills/ or writing skills/ or *literacy/ or *mathematics/ or *reading/ or *tutoring/
#6	#4 OR #5
#7	#3 AND #6
	Limits: (100 childhood <birth to age 12 yrs> or 160 preschool age <age 2 to 5 yrs> or 180 school age <age 6 to 12 yrs> or 200 adolescence <age 13 to 17 yrs>)

ERIC (via Proquest), conducted 9th December 2014

Search	Query
#1	AB,TI,IF("foster care*" OR "foster child*" OR "foster home*" OR "foster youth*" OR "kinship care*" OR "out of home" OR "alternative care" OR "looked after" OR "group home" OR "group care" OR "guardianship" OR "residential care" OR "public care" OR "state care" OR "congregate care"
#2	SU.EXACT.EXPLODE("Foster Care") OR SU.EXACT("Group Homes") OR SU.EXACT("Residential Care")
#3	#1 OR #2
#4	AB,TI,IF(education* OR academic OR school OR literacy OR read OR reading OR math* OR numerary OR spell* OR writ* OR graduate* OR tutor* OR liaison)
#5	SU.EXACT.EXPLODE("Achievement") OR SU.EXACT.EXPLODE("Academic Education") OR SU.EXACT.EXPLODE("Academic Aptitude") OR SU.EXACT("Outcomes of Education") OR SU.EXACT.EXPLODE("Educational Programs") OR SU.EXACT.EXPLODE("Educational Objectives") OR SU.EXACT.EXPLODE("Educational Strategies") OR SU.EXACT.EXPLODE("Educational Assessment") OR SU.EXACT.EXPLODE("Educational Status Comparison") OR SU.EXACT.EXPLODE("Remedial Instruction") OR SU.EXACT.EXPLODE("Paraprofessional School Personnel") OR SU.EXACT.EXPLODE("Schools") OR SU.EXACT.EXPLODE("School Effectiveness") OR SU.EXACT.EXPLODE("Grade Repetition") OR SU.EXACT.EXPLODE("Academic Failure") OR SU.EXACT.EXPLODE("Achievement Gap") OR SU.EXACT.EXPLODE("Educationally Disadvantaged") OR SU.EXACT.EXPLODE("Educational Needs") OR SU.EXACT.EXPLODE("Learning Problems") OR SU.EXACT.EXPLODE("At Risk Students") OR SU.EXACT.EXPLODE("Special Needs Students") OR SU.EXACT.EXPLODE("Student Educational Objectives") OR SU.EXACT.EXPLODE("Reading Difficulty") OR SU.EXACT.EXPLODE("Reading Comprehension") OR SU.EXACT("Spelling") OR SU.EXACT.EXPLODE("Individual Instruction") OR SU.EXACT.EXPLODE("Mathematics

	Education") OR SU.EXACT.EXPLODE("Language Skills") OR SU.EXACT.EXPLODE("Language Arts") OR SU.EXACT("Reading Instruction") OR SU.EXACT("Spelling Instruction") OR SU.EXACT("Writing Instruction") OR SU.EXACT("Literacy") OR SU.EXACT("Mathematics Instruction") OR SU.EXACT("numeracy")))
#6	#4 OR #5
#7	#3 AND #6
	Exclude: Education level: Higher Education; Adult Education; Postsecondary Education; Two Year Colleges; Adult Basic Education

Sociological Abstracts (via Proquest), conducted 10th December 2014

Search	Query
#1	AB,TI,IF("foster care" OR "foster child*" OR "foster home" OR "foster youth" OR "kinship care" OR "out of home" OR "alternative care" OR "looked after" OR "group home" OR "group care" OR "guardianship" OR "residential care" OR "public care" OR "state care" OR "congregate care")
#2	SU.EXACT.EXPLODE("Foster Care") OR SU.EXACT.EXPLODE("Foster Children") OR SU.EXACT.EXPLODE("Guardianship") OR SU.EXACT("Group Homes") OR SU.EXACT("Residential Care") OR SU.EXACT.EXPLODE("Placement")
#3	#1 OR #2
#4	AB,TI,IF(education* OR academic OR school OR literacy OR read OR reading OR math* OR numeracy OR spell* OR writ* OR graduat* OR tutor* OR liaison)
#5	SU.EXACT.EXPLODE("Educational Attainment") OR SU.EXACT.EXPLODE("Academic Aptitude") OR SU.EXACT.EXPLODE("Academic Achievement") OR SU.EXACT.EXPLODE("Grades (Scholastic)") OR SU.EXACT("Learning") OR SU.EXACT.EXPLODE("School Environment") OR SU.EXACT.EXPLODE("Student Evaluation") OR SU.EXACT.EXPLODE("Educational Programs") OR SU.EXACT.EXPLODE("Reading") OR SU.EXACT("Writing") OR SU.EXACT("Literacy") OR SU.EXACT.EXPLODE("Mathematics") OR SU.EXACT.EXPLODE("Learning Disabilities") OR SU.EXACT.EXPLODE("Educational Inequality") OR SU.EXACT.EXPLODE("Educational Opportunities")
#6	#4 OR #5
#7	#3 AND #6

Social Services Abstracts (via Proquest), conducted 10th December 2014

Search	Query
#1	(AB,TI,IF("foster care" OR "foster child*" OR "foster home" OR "foster youth" OR "kinship care" OR "out of home" OR "alternative care" OR "looked after" OR "group home" OR "group care" OR "guardianship" OR "residential care" OR "public care" OR "state care" OR "congregate care")
#2	(SU.EXACT.EXPLODE("Foster Care") OR SU.EXACT.EXPLODE("Foster Children") OR SU.EXACT.EXPLODE("Guardianship") OR SU.EXACT("Group Homes") OR SU.EXACT("Residential Care") OR SU.EXACT.EXPLODE("Placement")
#3	#1 OR #2
#4	(AB,TI,IF(education* OR academic OR school OR literacy OR read OR reading OR math* OR numeracy OR spell* OR writ* OR graduat* OR tutor* OR liaison)
#5	(SU.EXACT.EXPLODE("Educational Attainment") OR SU.EXACT.EXPLODE("Academic Aptitude") OR SU.EXACT.EXPLODE("Academic Achievement") OR SU.EXACT.EXPLODE("Grades (Scholastic)") OR SU.EXACT("Learning") OR SU.EXACT.EXPLODE("School Environment") OR SU.EXACT.EXPLODE("Student Evaluation") OR SU.EXACT.EXPLODE("Educational Programs") OR SU.EXACT.EXPLODE("Reading") OR SU.EXACT("Writing") OR SU.EXACT("Literacy") OR SU.EXACT.EXPLODE("Mathematics") OR SU.EXACT.EXPLODE("Learning Disabilities") OR SU.EXACT.EXPLODE("Educational Inequality") OR SU.EXACT.EXPLODE("Educational Opportunities")))
#6	#4 OR #5
#7	#3 AND #6

Proquest Dissertations and Theses conducted 11th December 2014

Search	Query
#1	AB,TI,IF("foster care*" OR "foster child*" OR "foster home*" OR "foster youth*" OR "kinship care*" OR "out of home" OR "alternative care" OR "looked after" OR "group home" OR "group care" OR "guardianship" OR "residential care" OR "public care" OR "state care" OR "congregate care"
#2	su.Exact("foster care")
#3	#1 OR #2
#4	AB,TI,IF(education* OR academic OR school OR literacy OR read OR reading OR math* OR numeracy OR spell* OR writ* OR graduat* OR tutor* OR liaison)
#5	su.Exact("reading" OR "literacy" OR "academic standards" OR "educational tests & measurements" OR "educational evaluation" OR "learning" OR "education" OR "school

	effectiveness" OR "mathematics" OR "tutoring" OR "educational services" OR "elementary education" OR "literacy programs" OR "educational attainment" OR "reading comprehension" OR "peer tutoring" OR "educational materials" OR "reading instruction" OR "learning disabilities" OR "academic failure" OR "academic achievement gaps" OR "academic achievement" OR "mathematics education")
#6	#4 OR #5
#7	#3 AND #6

Google Scholar search

1. allintitle: academic OR education "foster care"
Publication date: anytime
Searched: 13th January, 2015
Results: 126

2. allintitle: academic OR education "residential care" -age -aged -dementia –older
Publication date: anytime
Searched: 13th January, 2015
Results: 51

Google search

1. allintitle: academic OR education "foster care"
Publication date: 1964 - 2015
Searched: 13th January, 2015
Language: English
Results: 368

Websites searched

http://www.acf.hhs.gov/
http://www.cachildwelfareclearinghouse.org/
http://www.letterboxclub.org.uk/research-and-evaluation/
www.literacytrust.org.uk
www.interventionsforliteracy.org.uk
http://www.thewhocarestrust.org.uk/
http://www.chapinhall.org/
https://www.childwelfare.gov/
http://cwrp.ca/
https://www.opressrc.org/about-ssrc
http://www.casey.org/resources/
http://www.acf.hhs.gov
http://www.childtrends.org
http://www.thepyjamafoundation.com/
http://www.fostercare.org.au/
http://www.berrystreet.org.au/
https://www.sprc.unsw.edu.au/
https://aifs.gov.au/cfca/

http://reescentre.education.ox.ac.uk/
http://www.acwa.asn.au/index.php
http://www.urban.org

Appendix 3: Critical appraisal tool

JBI Critical Appraisal Checklist for Randomised Control / Pseudo-randomised Trial

Reviewer _ Date _

Author _ Year _ _ _ _ _ _ _ Record Number _ _ _ _ _ _ _

	Yes	No	Unclear	Not Applicable
1. Was the assignment to treatment groups truly random?	☐	☐	☐	☐
2. Were participants blinded to treatment allocation?	☐	☐	☐	☐
3. Was allocation to treatment groups concealed from the allocator?	☐	☐	☐	☐
4. Were the outcomes of people who withdrew described and included in the analysis?	☐	☐	☐	☐
5. Were those assessing outcomes blind to the treatment allocation?	☐	☐	☐	☐
6. Were the control and treatment groups comparable at entry?	☐	☐	☐	☐
7. Were groups treated identically other than for the named interventions	☐	☐	☐	☐
8. Were outcomes measured in the same way for all groups?	☐	☐	☐	☐
9. Were outcomes measured in a reliable way?	☐	☐	☐	☐
10. Was appropriate statistical analysis used?	☐	☐	☐	☐
	☐	☐	☐	☐

Overall appraisal: Include ☐   Exclude ☐   Seek further info. ☐

Comments (Including reason for exclusion)

_____

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Appendix 4: Data extraction template

Study ID *(Study author and year of publication)*

General Information

Date form completed	
Name of person extracting data	
Study funding sources	
Possible conflicts of interest	

Population and setting

	Description	Location in text
Setting		
Inclusion criteria		
Exclusion criteria		
Method/s of recruitment		
Informed consent obtained		

Methods

	Descriptions as stated in report/paper	Location in text
Aim of study		
Design		
Start / End date		
Length to follow-up		
Ethical approval		
Notes:		

Participants

	Description as stated in report/paper	Location in text
Sample size		
Baseline imbalances		
Withdrawals / exclusions		
Age		
Sex		
Race/Ethnicity		
Placement type		

Intervention groups

	Description as stated in report/paper	Location in text
No. randomised to group		
Comparator		
Theoretical basis		
Description		
Duration		
Format		
Intensity		
Delivery		
Fidelity		

Outcomes

	Description as stated in report/paper	Location in text
Outcome name		
Outcome measure		
Time points measured		
Outcome definition		
Person measuring/reporting		
Is outcome/tool validated?		
Imputation of missing data		

Results

	Description as stated in report/paper						Location in text
Comparison							
Outcome							
Timepoint							
Post-intervention or change from baseline?							
Results	**Intervention**			**Comparison**			
	Mean	SD	No. participants	Mean	SD	No. participants	
No. missing participants and reasons:							
No. participants moved from other group and reasons:							
Any other results reported:							
Statistical methods used and appropriateness of these methods:							

Other information

	Description as stated in report/paper	Location in text
Conclusions of study authors		
References to other relevant studies		
Study Limitations / Risk of Bias:		

Appendix 5: Excluded Studies

1. Bauer MI. Evaluation of an educational mentoring program for children in foster care [dissertation]. [California]: San Jose State University; 2002. 44 p.
Reason for exclusion: wrong population; study included foster youth ≥18 years of age.

2. Colombey H. Maintaining basic skills through summer thematic tutoring with exceptional students in residential foster care [dissertation]. [Florida]: Nova Southeastern University; 1995. 89 p.
Reason for exclusion: wrong study design; pre- and post- study design without an adequate control.

3. Davidson WS, Wolfred TR. Evaluation of a community-based behaviour modification program for prevention of delinquency: The failure of success. Community Ment Health J. 1977;13(4):296-306.
Reason for exclusion: wrong population; residential treatment centre for delinquent children that aims to prevent OOHC placement.

4. Dymoke S, Griffiths R. The Letterbox Club: The impact on looked-after children and their carers of a national project aimed at raising achievements in literacy for children aged 7 to 11 in foster care. J Res Spec Educ Needs. 2010;10(1):52-60.
Reason for exclusion: wrong outcome; measured qualitative impact of the intervention - no relevant measure of academic achievement.

5. Edwards L, Chard DJ. Curriculum reform in a residential treatment program: Establishing high academic expectations for students with emotional and behavioral disorders. Behavioral Disorders. 2000; 25(3):259-63.
Reason for exclusion: wrong population; study participants were children in residential care for treatment of emotional behavioural disturbance.

6. Finn J, Kerman B, LeCornec J. Reducing the digital divide for children in foster care: first-year evaluation of the building skills-building futures program. Res Soc Work Pract. 2005;15(6):470-80.
Reason for exclusion: wrong outcome; no relevant measure of academic achievement reported. Study reported proxy measures of academic achievement (perception of improvement in technology skills, homework and grades).

7. Fox P, Avramidis E. An evaluation of an outdoor education programme for students with emotional and behavioural difficulties. Emot Behav Diffic. 2003;8(4):267-83.
Reason for exclusion: wrong population; study included participants with emotional behavioural disorders recruited through various sources.

8. Griffiths R. The Letterbox Club: An account of a postal club to raise the achievement of children aged 7 to 13 in foster care. Child Youth Serv Rev. 2012; 34(6):1101-06.
Reason for exclusion: no primary data; discussion article.

9. Jeffers VR. Tutoring foster care adolescents in reading, mathematics, and self-esteem skills, utilizing individualized and small group approaches [dissertation]. [Washington, D.C.]: Howard University; 1996. 289 p.
    Reason for exclusion: wrong population; study included participants ≥18 years of age.

10. Johnson SB. Therapeutic mentoring: Outcomes for youth in foster care [dissertation]. [Chicago]: Loyola University Chicago; 2009. 127 p.
    Reason for exclusion: wrong population, study included participants ≥18 years of age.

11. Kroner MJ, Mares AS. Lighthouse independent living program: Characteristics of youth served and their outcomes at discharge. Child Youth Serv Rev. 2009;31(5):563-71.
    Reason for exclusion: wrong population; the OOHC population could not be disaggregated from the sample of delinquent youth included in the study.

12. Leve LD, Chamberlain P. A randomized evaluation of multidimensional treatment foster care: Effects on school attendance and homework completion in juvenile justice girls. Res Soc Work Pract. 2007;17(6):657-63.
    Reason for exclusion: wrong outcome; relevant measure of academic achievement was not reported. The study reported secondary outcome (school attendance) and proxy measure of academic achievement (homework completion).

13. Lindsey EW, Ahmed FU. The North Carolina Independent Living Program: A comparison of outcomes for participants and nonparticipants. Child Youth Serv Rev. 1999;21(5):389-412.
    Reason for exclusion: wrong population; study included participants ≥18 years of age.

14. Lustig ML. A silent and significant subgroup: Closing the achievement gap for students in foster care [dissertation]. [San Diego]: University of California; 2008. 128 p.
    Reason for exclusion: wrong population; study included participants ≥18 years of age.

15. Moffat S, Vincent C. Emergent literacy and childhood literacy-promoting activities for children in the Ontario Child Welfare System. Vulnerable Child Youth Stud. 2009;4(2):135-41.
    Reason for exclusion: wrong outcome; only proxy measure of academic achievement reported: frequency of literacy activities.

16. O'Brien M, Rutland J. Outcomes of a supplemental learning program for children in care at family and children's services of Renfrew County. Journal of the Ontario Association of Children's Aid Societies. 2008;52(4):11-14.
    Reason for exclusion: wrong study design; pre- and post-test without an adequate control.

17. Rawson HE. Academic gain in maladjusted children. Therapeutic Care & Education. 1993; 2(3): 392-403.

Reason for exclusion: wrong population; the study involved youth from a remedial mental health rehabilitation setting.

18. Rhoades KA, Chamberlain P, Roberts R, Leve LD. MTFC for high-risk adolescent girls: A comparison of outcomes in England and the United States. J Child Adolesc Subst Abuse. 2013;22(5):435-49.
Reason for exclusion: wrong outcome; no relevant measure of academic achievement reported. The study only reported secondary outcome (school attendance) and proxy measure of academic achievement (time spent on homework).

19. Rosenblatt A, Attkisson CC. Integrating systems of care in California for youth with severe emotional disturbance IV: Educational attendance and achievement. J Child Fam Stud. 1997;6(1):113-29.
Reason for exclusion: wrong population; the study involved youth placed in residential treatment for severe emotional disturbance.

20. Scannapieco M, Schagrin J, Scannapieco T. Independent living programs: Do they make a difference? Child Adolesc Social Work J. 1995;12(5):381-9.
Reason for exclusion: wrong population; study included participants ≥18 years of age.

21. Soenen B, Volckaert A, D'Oosterlinck F, Broekaert E. The implementation of life space crisis intervention in residential care and special education for children and adolescents with EBD: An effect study. J Emot Behav Disord. 2014;85(3):267-284.
Reason for exclusion: wrong population; study involved children placed in residential treatment facility for emotional behavioural disorders and their families.

22. Swick DC. The effects of parental involvement on children's school readiness skills [dissertation]. [North Carolina]: University of North Carolina; 2007. 153 p.
Reason for exclusion: wrong population; study involved children from the general population.

23. Tideman E, Vinnerljung B, Hintze K, Aldenius A. Improving foster children's school achievements: Promising results from a Swedish intensive study. Adoption & Fostering. 2011;35(1):44-56.
Reason for exclusion: wrong study design; pre- post-test study without a control group.

24. Trout AL, Tyler PM, Stewart MC, Epstein MH. On the Way Home: Program description and preliminary findings. Children and Youth Services Review. 2012;34(6):1115-20.
Reason for exclusion: wrong outcome; relevant measure of academic achievement was not reported. Study outcomes examined included study participant's school engagement and stability.

25. Tyre AD. Educational supports for middle school youths involved in the foster care system. Child Sch. 2012;34(4):231-8.
Reason for exclusion: wrong study design, pre- post-test study design without control group.

26. Waxman HC, Houston WR, Profilet SM, Sanchez B. The long-term effects of the Houston Child Advocates, Inc., program on children and family outcomes. Child Welfare. 2009;88(6):23-46.
Reason for exclusion: wrong population; study included participants ≥18 years of age.

27. Windsor J, Moraru A, Nelson CA, III, Fox NA, Zeanah CH. Effect of foster care on language learning at eight years: Findings from the Bucharest Early Intervention Project. J Child Lang. 2013;40(3):605-27.
Reason for exclusion: no specific intervention; outcomes of children placed in foster care were compared with those placed in institutional care.

28. Zetlin A, Weinberg L, Kimm C. Improving education outcomes for children in foster care: Intervention by an education liaison. Journal of Education for Students Placed at Risk. 2004;9(4):421-9.
Reason for exclusion: wrong study design; pre- and post-test, quasi-experimental study design.

29. Zetlin AG, Weinberg LA, Shea NM. Improving educational prospects for youth in foster care: The education liaison model. Interv Sch Clin. 2006;41(5):267-72.
Reason for exclusion: no primary data; discussion article.

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