Effective interventions to reduce suicidal thoughts and behaviours among children in contact with child protection and out-of-home care systems – a rapid evidence review

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Contents

1. Executive Summary

1.1. **Background**

Suicide is the leading cause of death over the past six years in young people generally, and it has increased across every state and jurisdiction. This increase is concerning. Evidence suggests children and young people in out-of-home care (OOHC) are 4.9 times more likely to display suicidal behaviour than their 'at home' peers. More than 170,000 children were brought to the attention of child protection services across Australia in the 2018-19 period. This is alarming and warrants appropriate interventions to prevent suicidal behaviour in children and young people who interact with the child protection and OOHC systems.

1.2. **Aim**

The aim of this rapid evidence review is to outline the role played by involvement in the child protection system—including placement in OOHC—as a risk factor for suicidal behaviour. We also aim to review the effectiveness of interventions focused on OOHC for at-risk children in reducing suicidal thoughts, suicide attempts and suicide deaths.

The National Suicide Prevention Taskforce, through the Suicide Prevention Research Fund managed by Suicide Prevention Australia, commissioned the Institute of Child Protection Studies at Australian Catholic University to conduct this review of the literature. We aimed to answer the following research questions:

1. What role do risk factors associated with childhood trauma and interactions with the child protection and out-of-home system play in suicidal behaviour?
2. What interventions have been shown to be effective in reducing suicidal thoughts and behaviours among children involved in the out-of-home care system?
3. What recommendations could be made about interventions that may be most appropriate and feasible within the Australian context?

1.3. **Findings**

Our first key finding was that the risk factors for suicide, as identified in the general population, overlap in almost all aspects with characteristics of children in OOHC. These characteristics include psychological factors, stressful life events and personality characteristics.

We identified two studies using a systematic search for and review of literature related to interventions aimed at preventing suicidal behaviour in young people in OOHC. These two studies evaluated interventions and measured changes in suicide-related behaviours in young people. Using a quality assessment tool, one study was found to be moderate in quality, and the other was high in quality. Both studies showed a reduction in participant suicidal thoughts, but in the study that assessed suicide attempts, suicidal thoughts did not decrease.

We also identified several studies that evaluated interventions delivered by training staff and carers aimed at reducing suicidal behaviours in OOHC young people. These interventions are sometimes referred to as 'Gatekeeper training programs'. Although they have been successful in improving the knowledge and confidence of staff and/or carers, research has not been conducted that shows if they lead to a reduction in suicidal behaviours in young people.

1.4. **Implications**

As a result of our findings we identify three overarching sets of implications.

What can be implemented now

Existing interventions that target suicidal behaviours in the general population should be implemented and evaluated for their success in reducing suicidal behaviours in young people in OOHC. These include Dialectical Behaviour Therapy, Cognitive Behavioural Therapy and others with a focus on emotional dysregulation and co-morbid psychological issues (i.e., alcohol and other drugs).

What needs to be developed

Our review identifies a clear need for the development of trauma-focused therapeutic interventions, specifically with the ability to support the cultural needs of Aboriginal and Torres Strait Islander young people, who are overrepresented in the Australian child protection and care systems. These interventions would be supported by the development of trauma-informed care models and should be holistic in nature (i.e., they target multiple intertwined risk factors and health outcomes).

What research should occur

Considering that globally only two studies have evaluated the efficacy of interventions to reduce suicidal behaviours in young people in OOHC, we suggest the adoption of high-quality evaluations of part of any intervention developed and/or used to reduce suicidal behaviour in young people interacting with child protection and OOHC systems across Australia.

2. Background

In this report, we use the term 'suicidal behaviour' to encompass a broad variety of concepts, including suicidal ideation and thoughts, suicidal plans and attempts, and suicidal death. We have excluded studies that deal only with self-harming, injurious or cutting behaviours unless the authors have included these outcomes within a broader study of suicidal behaviours, or if the behaviour of self-harming was undertaken with the intention of death as the outcome.

In this report, we refer to the out-of-home care system (OOHC) as contact with the child protective and care systems that results in placement in foster care, kinship care or residential care. Comparable research on this population in international studies may refer to 'looked after children' (in the United Kingdom) or 'children in alternative care' (in North America).

2.1. **Suicide is a universal issue**

Suicidal behaviour among young people is a significant public health issue (Carballo et al., 2019; Bilsen, 2018; Rukundo et al., 2018). Studies investigating global mortality patterns have found that suicide is among the top five leading causes of death for young people (Bilsen, 2018; Blum & Nelson-Nmari, 2004; Borowsky et al., 1999; Patton et al., 2009; Wasserman et al., 2005; Zhao & Zhang, 2015). While the prevalence of suicide attempts among young people peaks throughout adolescence, the prevalence of death by suicide increases steadily into young adulthood (Carballo et al., 2019). In Australia, suicide has been reported by the Australian Bureau of Statistics as the leading cause of death among young people for the past 6 years (ABS, 2014; 2015; 2016; 2017; 2018; 2019). Between 2008 and 2017, the number of deaths by suicide and standardised death rates for suicide among young people increased across all states and territories (ABS, 2017).

Suicide prevention interventions with the most promising evidence base include emotional regulation-based interventions and cognitive-based interventions. An example is dialectical behaviour therapy which decreases trauma-based symptoms and suicidality in adolescents (Geddes et al., 2013). The leading theory is that those who engage in suicidal behaviours have high levels of emotional dysregulation (Eaddy et al., 2019; Law & Anestis, 2015; Neacsiu et al., 2017; Wolff et al., 2019). Promising and evidence-based interventions sourced from Conley Wright et al. (2020) are listed in Table 1 below.

Table 1. Evidence-based or promising interventions to prevent suicide in young people in the general population

Evidence-based	Promising
Multisystemic therapy and family therapies such as Attachment Based Family Therapy Therapeutic Assessment Brief Intervention Contact Post-intervention and counselling Screening, psychoeducation, and skills training Gatekeeper training	Dialectical Behaviour Therapy Cognitive Behavioural Therapy Interpersonal Therapy Developmental Group Therapy

2.2. Risk factors for suicidal behaviour in children and young people in the general population

Psychosocial factors contribute most to the suicidal risk profile in children and young people (Carballo et al., 2019; Bridge et al., 2006), with the most significant factors including:

- psychological factors: depression, anxiety, drug and alcohol use, comorbid psychiatric disorder, history of self-harming
- stressful life events: family problems and peer conflicts, bullying, all forms of abuse, in particular sexual abuse and suicide or attempted suicide of a family member or peer
- personality traits: neuroticism, impulsivity, self-esteem and resilience (Bilsen, 2018; Bradvik, 2018; Bridge et al., 2006; Bye, 2008; Carballo et al., 2019; Centre for Suicide Prevention, 2000; Mars & Burrows et al., 2014; Mars & Heron et al., 2014; McKee & Shkolnikov, 2001; Nemtstov, 2003; Tishler et al., 2007).

The strongest risk factors for suicidal behaviour among children and young people are major psychiatric problems, depression, substance abuse disorder (Bradvik, 2018; Carballo et al., 2019; Goldston et al., 2009) and sexual abuse in childhood (Bahk et al., 2017). Childhood abuse has shown to indirectly predict suicidal ideation via links between anxiety, childhood neglect and perceived social support (Bahk et al., 2017). However, other studies (Bensley et al., 1999; Kaplan, et al., 1999; Locke & Newcomb, 2005; Thompson et al., 2012) found that child abuse and neglect are direct predictors of suicidal ideation.

The evidence highlights the complexity of suicide among young people and suggests a cumulative interaction of these contributing factors (Carballo et al., 2019). This is sometimes referred to as 'cumulative harm' (see Bromfield, Gillingham, & Higgins, 2007).

2.3. Suicidal behaviour in the out-of-home care population

For at least two decades, studies across a variety of countries including Australia, New Zealand, England, Canada, the United States and Finland, have shown that children and young people placed into OOHC are at an elevated risk of suicidal behaviour (Beautrais, 2001; Dube et al., 2001; Evans et al., 2017; Kalland et al., 2001; Katz et al., 2011) and report higher than average suicide attempts across the lifespan (Afifi et al., 2015). In their systematic review and meta-analysis, Evans et al. (2017) suggest that children and young people residing in care have a higher rate of exposure to established risk factors for suicidal behaviour and are more than three times as likely to attempt suicide compared to non-care populations (Evans et al., 2017).

In Australia, multiple reviews across state and territory jurisdictions into child deaths by suicide revealed that children with a history of child protection or OOHC involvement were at an increased risk of suicide and were up to four times more likely to die by suicide than children with no child welfare involvement (NSW Child Death Review Team, 2015; Consultative Council on Obstetric and Paediatric Mortality and Morbidity, 2017; Queensland Family & Child Commission, 2016a; Queensland Family & Child Commission, 2016b). Soole et al. (2014) demonstrated that Indigenous children were significantly more likely to be living away from the family home prior to their death by suicide when compared to non-Indigenous children.

2.4. Child protection and out-of-home care systems in Australia

According to the Australian Institute of Health and Welfare (AIHW, 2020), in the most recent financial year (2018–19), around 170,000 children aged 0–17 received child protection services from the six states and two territories in Australia. This covers three 'types' of contact or care:

1. investigations, which may or may not then lead to substantiation of harm or risk of harm from child abuse or neglect
2. care and protection orders
3. OOHC placement.

OOHC placement is mostly family-like placements (kinship or foster care). Only 6.4% of children in the Australian OOHC system live in residential care which is mainly used for children with complex needs.

More than half of investigations by statutory child protection services in Australia do not lead to a care and protection order or placement in OOHC. In such cases, there is no further statutory responsibility for the children, no government data system to understand their trajectory, and little research to understand the health and wellbeing outcomes of children who are notified and investigated, but not placed on a care/protection order or removed into OOHC.

In Australia, children often enter care early in life. More than one-third of children in OOHC have been removed from their families for more than five years. Some studies (AIHW, 2020; Higgins, 2011; Higgins & Katz, 2008) have identified key issues about the characteristics of children and families in contact with child protection systems:

- Key risk factors for contact with child protection systems include parental substance misuse, poorly treated parental mental health issues, and family violence.
- Aboriginal and Torres Strait Islander children are significantly over-represented (e.g., in 2020, AIHW noted that they were eight times as likely as non-Indigenous children to have received child protection services).
- Intergenerational vulnerability is also important, with parental OOHC experience a risk factor for removal of their children.
- Children in OOHC are typically subject to multiple placements, placement breakdowns, and instability of placements (including reunification with family and subsequent removal).

The work of statutory child protection systems has been significantly increasing, with rates per 1000 rising steadily over the past two decades (AIHW, 2020; Higgins, 2011; Higgins & Katz, 2008). In some jurisdictions, it is now recognised that up to one in five children will come to the attention of their statutory child protection service. However, to be placed on care and protection order and/or be placed in OOHC, children must have been harmed or at risk of significant harm relating to one of the grounds for intervention. Harm—and the legislative grounds for intervention—is defined in slightly different ways by the six states and two territories but covers what we consider to be child maltreatment: physical abuse, emotional abuse, sexual abuse, neglect, and exposure to domestic and family violence (see: https://aifs.gov.au/cfca/publications/australian-legal-definitions-when-child-need-protection).

Children who have been maltreated (including those known to child protection services and placed in OOHC) are at great risk of experiencing behavioural and mental health issues because of the maltreatment. Many children who are maltreated are exposed to multiple forms of child abuse and neglect; children with multi-type maltreatment are associated with even greater risk of negative psychosocial outcomes (Price-Robertson et al., 2013). The typical behavioural profile of children exposed to significant child abuse and/or neglect covers a range of diagnosable mental health and behavioural concerns, including delinquency, drug and alcohol use, high-risk sexual behaviours (Australian Institute of Family Studies, Chapin Hall Center for Children University of Chicago, & New South Wales Department of Family and Community Services, 2015).

Due to the typical behavioural profile of children exposed to significant child abuse and neglect placed into OOHC, trauma-informed care models are typically implemented in most child protection systems. However, in their Australian investigation into trauma-informed care models, Bailey et al. (2019) found the current evidence base for their effectiveness to be low, and that it is difficult to effectively evaluate outcomes. With no overarching framework for their deployment in Australia and a low evidence base for trauma-informed care models internationally, there remains a risk of unreliable and varying models of care for young people in OOHC. As highlighted by Wall et al. (2016, p.2):

> *…there are a small number of trauma-specific interventions that have been evaluated using a rigorous scientific standard and been shown to be effective, however, the research is often based on populations who have experienced a single traumatic event rather than those who experienced complex trauma.*

Children and young people in OOHC typically experience complex trauma, brought on by consistent and ongoing abuse and neglect (van der Kolk, 2000).

3. What role do risk factors associated with childhood trauma and interactions with the child protection and out-of-home care system play in suicidal behaviour?

3.1. Introduction

Although there is no direct evidence to suggest that placement into OOHC *causes* suicidal behaviour in children and young people per se, some authors (e.g., Evan et al., 2017) have suggested that children and young people placed in OOHC (foster, kinship, residential care) are at a greater likelihood to be exposed to established risk factors for suicide. With an aim to investigate the role that involvement in the child protection/OOHC system might play as a risk factor in suicidal behaviour, we conducted a rapid review and synthesis of the literature.

3.2. Method

We conducted a high-level synthesis of key data and evidence to investigate if there are any overlaps between (a) the risk factors for suicidal behaviour in children and young people at the general population level and (b) characteristics of young people who have experienced maltreatment and trauma (and its associated mental health outcomes) who interact with child protection and OOHC systems. Key data and evidence were sourced from a range of Australian government and non-government reports and websites and datasets, such as the Pathways of Care Longitudinal Study, and Australian and international peer reviewed literature, and Australian and international systematic reviews and meta-analyses. In their systematic review and meta-analysis, Evans et al. (2017) suggested that children and young people residing in OOHC might be more likely to be exposed to established risk factors for suicide. This study informed our three-step process:

1. We investigated and recorded what factors contribute most significantly to suicidal behaviours among children and adolescents in the general population
2. We investigated and recorded studies reporting on trauma outcomes among children and adolescents residing in OOHC systems
3. We mapped studies recorded in step 2 to factors recorded in step 1.

Based on the suggestions of Evans et al. (2017), we mapped studies reporting on trauma outcomes of children and adolescents residing in OOHC systems to the established psychosocial factors that contribute to the suicidal risk profile in children and adolescents among the general-level population (Bridge et al., 2006; Carballo et al., 2019).

3.3. **Findings**

Interpretation of the findings suggest that OOHC is associated with heightened risk for suicide-related behaviours. Most trauma-related outcomes reported in children and young people in the OOHC system are also key risk factors for suicidal behaviours. The findings below suggest that children and young people in OOHC are more likely to be exposed to established risk factors for suicidal behaviours (see Table 2).

The findings suggest that the trauma-related outcomes of children and young people in OOHC are directly related to almost all risk factors for suicidal behaviours. Therefore, to help minimise the potential role of OOHC as a risk factor, organisation-wide trauma-informed care models are likely to be beneficial (Wall et al., 2016).

Table 2. Parallels between risk factors for suicide and trauma outcomes seen in OOHC populations

Domain	Risk factors for suicidal behaviours among children and young people (not specific to OOHC populations)	Trauma characteristics and mental health outcomes of children and young people in OOHC across samples from Australia, the United States, Norway, and the United Kingdom
Psychological factors (including depression, anxiety, drug and alcohol use, comorbid psychiatric disorder, history of self-harming)	Psychiatric and depressive disorders are associated with suicidal behaviour in young people (Nock et al., 2013; Zubrick et al., 2017; Krishnaram & Devendran, 2010).	**AUSTRALIA.** Children in kinships and foster care had exceptionally poor mental health and socialisation, both in absolute terms, and relative to normative and in-care samples, and were at high risk of mental health problems (Tarren-Sweeney & Hazell, 2006). Caregivers reported that 53.4% of children in home-based foster care needed professional help for their mental health problems but only 26.9% had obtained help during the previous six months (Sawyer et al., 2007). Around 50% of children in OOHC reported with clinical depression and anxiety. Many also appeared to have considerable difficulty in regulating and expressing their emotions in a way conducive to healthy peer relationships and the formation of bonds with adults who might act as a parent towards them (Osborn & Delfabbro, 2006). 6.7% of young people aged 13–17 years in home-based foster care reported a suicide attempt that required medical treatment during the previous year (Sawyer et al., 2007). **UNITED STATES**. Young people in foster care had more past-year psychiatric symptoms, and especially more conduct symptoms, than those never placed in foster care. They were also four times more likely to attempt suicide in the preceding 12 months than those who were never placed in foster care (Pilowsky & Wu, 2006). Youth who enter the child welfare system and are put in an out-of-home placement may be at an increased risk for depressive symptoms, which in turn may increase their risk for suicide ideation (Anderson, 2011). **NORWAY.** Around 50% of children and young people in care had a mental health disorder (Lehmann et al., 2013).

Domain	Risk factors for suicidal behaviours among children and young people (not specific to OOHC populations)	Trauma characteristics and mental health outcomes of children and young people in OOHC across samples from Australia, the United States, Norway, and the United Kingdom
	Substance use, particularly alcohol, is associated with an increased prevalence of suicidal ideation and suicide attempts (Hawton et al., 2012; Hallfors et al., 2004).	**AUSTRALIA.** Children in OOHC have higher than average levels of drug and alcohol abuse (Mendes, 2012; Maunders et al., 1999; Cashmore & Paxman, 1996). Children who have experienced traumatic life events (e.g. child maltreatment) have a higher risk of detrimental outcomes including substance abuse issues (Stewart et al., 2001). **UNITED STATES**. Young people in foster care had more past-year substance use disorders than those who were never placed in foster care (Pilowsky & Wu, 2006). **UNITED KINGDOM**. Children and young people in care were more likely to use drugs or alcohol (Long et al., 2017).
	There is a positive association between Attention Deficit Hyperactivity Disorder (ADHD) and suicidality in both sexes and in all age groups (Balazs & Kereszteny, 2017).	**AUSTRALIA.** 11% of the sampled OOHC population self-reported specific learning/attention deficit disorder as causing difficulty for them (McDowall, 2018). 29% of children and young people aged 10-17 years with current or historical protective matters in any Victorian Children's Court between June 2016 to April 2017 were identified as experiencing ADHD (Baidawi & Piquero, 2020). **UNITED STATES**. More than a quarter of children in foster care have been diagnosed with ADHD (Administration on Children, Youth and Families, Children's Bureau, 2016). They were three times more likely to have an ADHD diagnosis than their peers (American Academy of Pediatrics, 2015).

Domain	Risk factors for suicidal behaviours among children and young people (not specific to OOHC populations)	Trauma characteristics and mental health outcomes of children and young people in OOHC across samples from Australia, the United States, Norway, and the United Kingdom
Stressful life events (family problems and peer conflicts, bullying, abuse, school failure, suicide or attempted suicide of a family member or peer)	Physical, sexual, and psychological maltreatment are key risk factors for suicide attempts (Sigfusdottir et al., 2013; Thompson et al., 2007).	**AUSTRALIA.** As well as experiencing a range of harm types that triggered their entry into OOHC (AIHW, 2017), children and young people were also likely to be placed in multiple out-of-home placements; exposed to workers and services in inappropriate or unsafe homes, or returned to the caregivers who initially perpetrated the abuse (Briggs and Hawkins, 1997; Irenyi et al., 2006). **UNITED STATES**. Children are typically placed into care after experiencing persistent maltreatment (Administration on Children, Youth and Families, Children's Bureau, 2016; Pears et al., 2008).
	School and academic performance failure, and poor peer-relationships are risk factors for suicide (Hawton et al., 2012).	**AUSTRALIA**. Growing up in care has negative effects on children's educational experiences (Harvey, 2006). Children in Western Australia with histories of child protection involvement (unsubstantiated maltreatment reports, substantiations, or OOHC placement) had a three-fold increased risk of low reading scores (Maclean et al., 2016). **UNITED STATES**. Young people who have been involved in the child welfare system were at high risk of educational failure and among the least likely to receive high-quality educational services (Leve & Chamberlain, 2007).
	Suicide and suicidal behaviour are highly familial and appear familiarly transmitted independently from a psychiatric disorder (Brent & Mann, 2005; Brent & Melhem, 2008; Hammerton et al., 2015).	**AUSTRALIA**. Young people in care in New South Wales were 4.9 times more likely to commit suicide than young people without a history of child protection. The young people who died from suicide had a history of risk-taking behaviour, had previously attempted suicide, were living with a mental illness or with a parent who had a mental illness and there had been a previous suicide in the family (New South Wales Department of Family and Community Services, 2014).

Domain	Risk factors for suicidal behaviours among children and young people (not specific to OOHC populations)	Trauma characteristics and mental health outcomes of children and young people in OOHC across samples from Australia, the United States, Norway, and the United Kingdom
Personality traits (neuroticism, impulsivity, low self-esteem, and resilience)	Personality traits identified as predisposing factors for suicidality in young people include neuroticism[1], perfectionism, interpersonal dependency, novelty-seeking[2], pessimism, low self-esteem, self-criticism (O'Connor et al., 2009; Martin et al., 2005; Chabrol & Saint-Martin, 2009; Enns et al., 2003; Barber, 2001).	**AUSTRALIA**. Growing up in care in Australia has negative effects on children's self-esteem (Fernandez, 2006). **UNITED STATES.** Children involved with child protective services in their early years underperform on cognitive and social indicators at school entry, irrespective of whether they remained with their families of origin. Cognitive and social indicators are associated with resilience (Sattler & Font, 2018). Children placed in long-term foster care during adolescence, with multiple placements, self-reported average/low domains of health and poor self-esteem, emotional discomfort, and low resilience (Kools et al., (2009). Children in group homes scored lower self-esteem compared to children in foster family homes (Gil & Bogart, 1982).

[1] Neuroticism is a personality trait involving a long-term tendency to be in a negative or anxious emotional state (Felman, 2018).

[2] Novelty-seeking (or sensation-seeking) is a personality trait that refers to a tendency to pursue new experiences with intense emotional sensations (Arenas & Manzanedo, 2016).

4. What interventions have been shown to be effective in reducing suicidal thoughts and behaviours among children in touch with the out-of-home care system?

4.1. Introduction

Findings from our investigation of the question "What role do risk factors associated with childhood trauma and interactions with the child protection and out-of-home system play in suicidal behaviour?" suggested that the trauma-related outcomes of children and young people in OOHC are directly related to almost all risk factors for suicidal behaviours. Therefore, interventions to effectively reduce suicidal thoughts and behaviours among children and young people in OOHC should work to reduce the trauma-related outcomes. This is likely to lead to a reduction in risk for suicidal behaviour in OOHC.

We conducted a systematic review of the international literature of interventions that have been shown to be effective in reducing suicidal thoughts and behaviours among children in touch with child protection/OOHC systems. See appendix for details of the methodology.

4.2. Findings

Overview of the two studies that met criteria inclusion

We identified only two studies that examined the effectiveness of interventions in reducing suicidal thoughts and behaviours among children involved in an OOHC system. Bonet et al. (2020) evaluated an intervention within the Spanish welfare system using a quasi-experimental, randomised control trial. Kerr et al. (2014) conducted their study in the north west of the United States using an experimental, randomised control trial (Kerr et al., 2014). In Table 3, we provide an overview of the samples involved in each of the reviewed studies, indicating age, gender[sex], and population characteristics/requirements to be included in each respective study.

We did not find any studies that investigated suicide interventions for OOHC populations in Australia.

Table 3. Participant characteristics of reviewed studies

	Bonet et al. (2020)	**Kerr et al. (2014)**
Age	12–17 years old *M* = 13.74 *SD* = 1.66	13–17 years old
Sex	All females (*N* = 166)	14 males, 5 females
Characteristics	Excluded if they had severe pathologies (including psychotic spectrum disorders), an intellectual disability or were unable to read and write in Spanish.	Showed chronic delinquent behaviour. Must have had at least one criminal referral in the last 12 months, be placed in (mandated) OOHC within 12 months after referral and were not pregnant at the time of recruitment.

4.3. **Quality assessment**

We conducted individual quality assessments—assessing the quality and appropriateness of the methodology and reporting—on both studies. The first two authors of this report conducted the quality assessments. We independently rated each of the in-scope articles scoring each article on a scale of 0 (never), 1 (partial) and 2 (yes) across 14 potential methodological and reporting attributes identified by Kmet et al. (2004). These attributes related to the description of the research question and method used, reporting of any random allocation and blinding (if appropriate to the study design), and the description of results and conclusions.

To generate the rating score, we added the total score obtained across relevant items and then divided by the total possible score (which may have not been all 14 criteria as some are not applicable to certain study designs) with a total possible score between 0 (low quality) and 1 (high). The Bonet et al. study received a score of .59 out of 1.0 from the first author and .54 from the second author. The Kerr et al. study received a score of .78 out of 1.0 from the first author and .82 from the second author. This resulted in an average quality rating of .80 for the Kerr et al. study and .57 for the Bonet et al. study. These ratings suggest a high quality for the Kerr et al. (2020) study and a moderate quality for the Bonet et al. (2016) study. The Kerr study benefitted from rigorous blinding of researchers in a methodologically sound randomised control trial with a control group.

4.4. **Type of interventions**

Bonet et al. (2020) evaluated an intervention that was a shortened version of Emotional Intelligence Therapy (EIT; Lizeretti, 2012 as cited in Bonet et al., 2020). It involved 16 sessions of 90 minutes duration, facilitated on a weekly basis. Bonet et al. adapted the existing intervention by removing 'inter-session activities' and 'recap sessions' (see Bonet et al., 2020 for a session-by-session breakdown). The therapy was facilitated by therapists (with a co-therapist) to seven groups of 7–11 participants within the residential centres.

Kerr et al. (2014) evaluated a family-based intervention called Multidimensional Treatment Foster Care (MTFC). It is based on social learning theory aimed at reducing delinquent behaviour. Trained, certificated foster carers implement a behavioural reinforcement model (i.e., positive behaviours are positively reinforced, so they occur more, while problem and maladaptive behaviours are not reinforced, in an effort to reduce them). Kerr et al. (p.5) describe the activities and tasks involved in the intervention:

> *Interventions were individualized but always included: daily telephone contact with foster parents; weekly group supervision and support meetings for foster parents; an in-home, daily point-and-level program for girls; individual therapy for each girl; family therapy for the aftercare placement family focusing on parent management strategies; close monitoring of school attendance, performance, and homework completion; case management to coordinate the interventions in the foster family, peer, and school settings; and 24-hr on-call staff support for foster and biological parents.*

The intervention also includes after-treatment placement with parents or caregivers trained in effective parent management. MTFC does not specifically target depression or suicide risk, but rather seeks to reduce problem behaviours and justice system involvement, many of which can be linked to increased depression and suicide thoughts and attempts. MTFC teaches and reinforces communication skills and emotion regulation to improve an individuals' anger and irritability. It also seeks to improve social support through reinforcement opportunities in family and school contexts, and through interactions with prosocial adults and peers–thereby contributing to a sense of belonging.

4.5. Outcome measures

Both studies used concrete and directly relevant outcome measures of suicide behaviour as well as additional concepts in line with the goals of the specific intervention each was evaluating. It is important to note that the Kerr et al. study was a longitudinal study that evaluated suicidal ideation and suicide attempts up to 12 years after baseline data were collected, in many cases going well into young adulthood, after participants had left residential facilities. The Bonet et al. study measured suicide behaviour only at baseline and 16 weeks post-treatment.

4.6. Suicide measures

Each study measured suicidal behaviour differently.

Bonet et al. (2020) measured suicidal orientation (understood as a continuous progression towards suicide passing through several stages) using the Spanish version of the Inventory of Suicide Orientation (ISO-30; King & Kowalchuk, 1994; adapted to Spanish by Casullo & Liporace, 2006 as cited in Bonet et al., 2020). The inventory considers suicide orientation to occur along a spectrum, whereby participants are classified as having a low, moderate, or high suicide orientation. Six critical items are used to identify suicidal ideation, where scores of two or greater (on a scale from 0 - 3) on three or more of the items represents a high risk–this is regardless of the overall score on the full inventory.

Kerr et al. (2014) measured suicidal ideation using a single item 'During the past week, how much were you bothered by thoughts of ending your life?' Participants answered either not at all, a little bit or very much. This was recoded into a dichotomous variable of the absence (not at all) or presence (a little bit or very much) of suicidal ideation. Suicide attempts were measured across the life of the study using the Columbia Suicide Severity Rating Scale. This scale uses standardised probes to identify whether attempts are classified by the criteria set out by Posner and colleagues (2008) of an actual attempt, an interrupted attempt, an aborted attempt, or a non-suicidal self-injury.

4.7. Were they effective?

Both studies showed that the interventions were effective in reducing suicide factors—suicidal ideation and suicidal orientation, respectively—in a relevant OOHC population (residential or foster care). Although one study analysed suicide attempts both during and post-treatment, no reduction from baseline was evident across all time points (Kerr et al., 2014). Bonet et al. (2020) did not measure suicide attempts as part of their evaluation of the EIT intervention.

Hopelessness plays an important role in the development of suicidal ideations. Bonet et al. (2020) found that when hopelessness reduced, suicidal ideation reduced. Bonet et al. also found that hopelessness had a positive mediating role between coping skills and suicide. Participants' abilities to control emotions was also a noted risk factor that improved as a result of the EIT intervention.

Kerr et al. (2014) claimed that their study design did not allow for a deep understanding of why both depression and suicide risk lowered. They hypothesised that "MTFC may impact girls' depressive symptoms and suicide risk by reducing delinquency and preventing a cascade of negative life consequences" (p. 11).

Findings for the second research question about the effectiveness of interventions found just two interventions for children and young people in OOHC. Both were largely based on improving emotional regulation which was found to be effective in reducing suicidal ideation and suicidal orientation. Due to the limited data available, a logical implication is that interventions that have been shown to work in addressing trauma-related outcomes are likely to reduce the risk of suicide in OOHC. Such interventions should have a strong focus on emotional regulation, as this is likely to lead to a reduction in risk for suicide in OOHC.

4.8. Gatekeeper training

We identified two studies (Kahsay et al., 2020; Osteen et al., 2018) that did not meet the criteria for being included in the systematic review of the literature. They did not include any outcome measures related to suicidal behaviour, but they did assess interventions aimed at improving staff or carer knowledge, attitudes, skills or behaviour (often referred to as 'Gatekeeper training').

Kahsay et al. (2020) assessed the safeTALK Training developed by LivingWorks Education Inc. This four-hour training was given to attendees (OOHC staff and two carers) at a child welfare conference. The results indicated increases in participants' knowledge, preparedness and self-efficacy as well as an increase in referrals to support services.

Osteen et al. (2018) assessed a training program, 'Youth and depression', within a suicide intervention curriculum in a single US-based organisation where staff were working with youth interacting with the child welfare system. The training has similar goals to the safeTALK training, but findings in the evaluation study were less positive, with only suicide assessment and intervention skills significantly improving.

5. What recommendations could be made about interventions that may be most appropriate and feasible within the Australian context?

Our recommendations fall under the following lines of inquiry:

1. What should be implemented now? These recommendations are based on what we know works for effectively addressing suicidal behaviours among the general population and among children and young people in OOHC.
2. What should be developed?
3. What research and practice gaps need to be addressed?

Overall, we recommend that interventions (such as emotion regulation strategies) should work towards minimising trauma-related outcomes, in order to reduce the risk for suicidal behaviours among children and young people in OOHC. Further, we recommend that more research must be undertaken in an Australian context to address gaps for effectively reducing suicidal behaviours for children and young people within the child protection and OOHC system.

5.1. **What should be implemented now**

Two types of therapeutic and training interventions have been tried and evaluated in the context of OOHC populations to reduce suicide-related behaviours:

- emotional regulation-based interventions (e.g. Dialectical Behaviour Therapy and Interpersonal Therapy) targeted at children and young people
- interventions targeted at child protection staff and foster and kinship carers, such as gatekeeping training, screening assessments, psychoeducation and skills training.

5.2. What should be developed

Our literature review revealed that there is an absence of evidence regarding appropriate suicide prevention interventions to address the known characteristics of young people interacting with the OOHC system – particularly the fact that children and young people have been abused and neglected, are experiencing trauma, and are overrepresented by Aboriginal and Torres Strait Islander children/young people. This suggests the need for:

- culturally appropriate interventions within a social ecological framework that recognise and influence health and healing across individual, social, organisational, community and public policy levels for Indigenous children and young people in OOHC settings (Chandler & Lalonde, 1998)
- culturally specific assessment of risk
- robust, overarching trauma-informed care model (concepts and principles) for OOHC that addresses the risk for suicidal behaviours
- clearly articulated definitions of trauma interventions for children and young people who have experienced complex trauma
- trauma-informed care to specific OOHC practice and service settings, including foster, kinship and residential care
- holistic interventions that target suicide as well as other related risk factors with poor health outcomes for OOHC young people (i.e., alcohol and other drug use, depression, emotional disturbances).

Interventions may be able to be adapted from other evidence-based interventions for Indigenous adults and young people, emphasising the need for a cultural assessment of risk for Indigenous children in OOHC. An example of a tool that measures cultural assessment of risk is the Westerman Aboriginal Symptom Checklist for Youth (WASC-Y) aged 13-17 years, a culturally and scientifically validated psychological test developed specifically for Aboriginal Australian youth (Indigenous Psychological Services, 2020). The tool identifies Aboriginal youth at risk of the majority of established risk factors for suicide, including depression, drug and alcohol use, impulsivity, anxiety, and suicidal behaviours (Westerman, 2003).

Using tools such as the WASC-Y in conjunction with Aboriginal mental health assessments and suicide prevention training may assist with the development and implementation of culturally specific intervention programs for Indigenous children and young people in contact with child protection and OOHC systems.

5.3. **Addressing gaps in the knowledge base**

Finally, we recommend further research in areas such as:

- evaluation of models of trauma-informed care that include a focus on whether they successfully reduce suicidal thoughts and behaviours
- high-quality empirical studies investigating trauma-informed care approaches
- effectiveness of culturally appropriate interventions to support the Indigenous community due to the over representation of this group in the OOHC population
- whether the way care systems operate affects the role played by OOHC as a risk factor for suicidal behaviour
- children and young people's experiences of health and wellbeing in OOHC
- whether interventions to reduce the risk of trauma associated with child maltreatment successfully reduce the risk of suicidal behaviour in children and young people placed in OOHC
- whether different trauma-informed approaches are required for different population groups including:
    - children versus adolescents
    - males versus females versus gender non-binary young people
    - Indigenous versus non-Indigenous children/young people
    - individuals with intellectual disability versus individuals without intellectual disability.

Considering that globally only two studies have evaluated the efficacy of interventions to reduce suicidal behaviours in young people in OOHC, we suggest the adoption of high-quality evaluations of part of any interventions developed and/or used to reduce suicidal behaviour in young people interacting with child protection and OOHC systems across Australia.

There is limited evidence currently available about effective interventions to address the risk of suicide-related behaviours for children and young people involved in the child protection system, including placement in OOHC. We know that child maltreatment is a significant risk factor for suicide. So, it is critical to address the known risk factors for suicide through interventions that are known to be effective, such as trauma-based interventions, and other interventions yet to be evaluated.

6. References

Administration on Children, Youth and Families, Children's Bureau, (2016) Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD) [Internet] Access through google.com.au 24th June 2020

Arenas, M.C.& Manzanedo, C. (2016). Novelty Seeking. In: Zeigler-Hill V., Shackelford T. (eds) *Encyclopedia of Personality and Individual Differences.* Springer.

Afifi, T. O., MacMillan, H. L., Taillieu, T., Cheung, K., Turner, S., Tonmyr, L., & Hovdestad, W. (2015). Relationship between child abuse exposure and reported contact with child protection organizations: Results from the Canadian Community Health Survey. *Child Abuse & Neglect*, *46*, 198-206.

American Academy of Pediatrics. (2015, October 23). Children in foster care three times more likely to have ADHD diagnosis. *ScienceDaily*. https://www.sciencedaily.com/releases/2015/10/151023083721.htm

Anderson, H. D. (2011). Suicide ideation, depressive symptoms, and out-of-home placement among youth in the US child welfare system. *Journal of Clinical Child & Adolescent Psychology*, *40*(6), 790-796.

Australian Bureau of Statistics. (2014). 3303.0 - Causes of Death, Australia, 2014. Australian Bureau of Statistics. https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/3303.0~2014~Main%20Features~Leading%20Causes%20of%20Death~10001

Australian Bureau of Statistics. (2015). 3303.0 - Causes of Death, Australia, 2014. Australian Bureau of Statistics. https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/3303.0~2015~Main%20Features~Australia's%20leading%20causes%20of%20death,%202015~3

Australian Bureau of Statistics. (2016). 3303.0 - Causes of Death, Australia, 2015. Australian Bureau of Statistics. https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/3303.0~2016~Main%20Features~Intentional%20self-harm:%20key%20characteristics~7

Australian Bureau of Statistics. (2017). 3303.0 - Causes of Death, Australia, 2016. Australian Bureau of Statistics. https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/3303.0~2017~Main%20F

eatures~Australia's%20leading%20causes%20of%20death,%202017~2#:~:text=on%20you%20browser.,Australia's%20leading%20causes%20of% 20death%2C%202017,for%2011.6%25%20of%20all%20deaths.

Australian Bureau of Statistics. (2018). 3303.0 - Causes of Death, Australia, 2017. Australian Bureau of Statistics. https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/3303.0~2017~Main%20Features~Intentional%20self-harm,%20key%20characteristics~3

Australian Bureau of Statistics. (2019). 3303.0 - Causes of Death, Australia, 2018. Australian Bureau of Statistics. https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/3303.0~2018~Main%20Features~Intentional%20self-harm,%20key%20characteristics~3

Australian Institute of Family Studies, Chapin Hall Center for Children University of Chicago, & New South Wales Department of Family and Community Services (Eds.) (2015), *Pathways of Care Longitudinal Study: Outcomes of Children and Young People in Out-of-Home Care in New South Wales: Wave 1 Baseline Statistical Report***.** Sydney: NSW Department of Family and Community Services.

Australian Institute of Health and Welfare (2020). *Child protection Australia 2018–19.* Child welfare series no. 72. Cat. no. CWS 74. Canberra: AIHW. www.aihw.gov.au/reports/child-protection/child-protection-australia-2018-19

Bahk, Y. C., Jang, S. K., Choi, K. H., & Lee, S. H. (2017). The relationship between childhood trauma and suicidal ideation: role of maltreatment and potential mediators. *Psychiatry Investigation*, *14*(1), 37-43.

Baidawi, S., & Piquero, A. R. (2020). Neurodisability among children at the nexus of the child welfare and youth justice system. *Journal of Youth and Adolescence,* 1-17. https://doi.org/10.1007/s10964-020-01234-w

Bailey, C., Klas, A., Cox, R., Bergmeier, H., Avery, J., & Skouteris, H. (2019). Systematic review of organisation-wide, trauma-informed care models in out-of-home care (Oo HC) settings. *Health & Social Care in the Community, 27*(3), e10-e22.

Balazs, J., & Kereszteny, A. (2017). Attention-deficit/hyperactivity disorder and suicide: A systematic review. *World Journal of Psychiatry*, *7*(1), 44-59.

Barber, J. G. (2001). Relative misery and youth suicide. *Australian & New Zealand Journal of Psychiatry*, *35*(1), 49-57.

Beautrais A. L. (2001). Risk factors for suicide and attempted suicide among young people. *The Australian and New Zealand journal of psychiatry, 34*(3), 420–436. https://doi.org/10.1080/j.1440-1614.2000.00691.x

Bensley, L. S., Van Eenwyk, J., Spieker, S. J., & Schoder, J. (1999). Self-reported abuse history and adolescent problem behaviors. I. Antisocial and suicidal behaviors. *Journal of Adolescent Health*, *24*(3), 163-172.

Bilsen, J. (2018). Suicide and youth: Risk factors. *Frontiers in Psychiatry*, *9*, 540.

Blum, R. W., & Nelson-Nmari, K. (2004). The health of young people in a global context. *Journal of Adolescent Health*, *35*(5), 402-418.

Bonet, C., Palma, C., & Santos, G. G. (2020). Effectiveness of Emotional Intelligence Therapy on Suicide Risk among Adolescents in Residential Care. *International Journal of Psychology and Psychological Therapy, 20*(1), 61-74.

Borowsky, I. W., Resnick, M. D., Ireland, M., & Blum, R. W. (1999). Suicide attempts among American Indian and Alaska Native youth: Risk and protective factors. *Archives of Pediatrics & Adolescent Medicine*, *153*(6), 573-580.

Brådvik L. (2018). Suicide Risk and Mental Disorders. *International Journal of Environmental Research and Public Health*, *15*(9), 2028. https://doi.org/10.3390/ijerph15092028

Brent, D. A., & Mann, J. J. (2005). Family genetic studies, suicide, and suicidal behavior. In *American Journal of Medical Genetics Part C: Seminars in Medical Genetics* (Vol. 133, No. 1, pp. 13-24). Hoboken: Wiley Subscription Services, Inc., A Wiley Company.

Brent, D. A., & Melhem, N. (2008). Familial transmission of suicidal behavior. *Psychiatric Clinics of North America*, *31*(2), 157-177.

Bridge, J. A., Goldstein, T. R., & Brent, D. A. (2006). Adolescent suicide and suicidal behavior. *Journal of Child Psychology and Psychiatry*, *47*(3-4), 372-394.

Briggs, F., & Hawkins, R. (1997). *Child protection: A guide for teachers and child care professionals.* Allen & Unwin.

Bromfield, L. M., Gillingham, P., & Higgins, D. J. (2007). Cumulative harm and chronic child maltreatment. *Developing Practice, 19*, 34-42. https://api.semanticscholar.org/CorpusID:142520862

Bye, E. K. (2008). Alcohol and homicide in Eastern Europe: A time series analysis of six countries. *Homicide Studies*, *12*(1), 7-27.

Carballo, J. J., Llorente, C., Kehrmann, L., Flamarique, I., Zuddas, A., Purper-Ouakil, D., ... & Buitelaar, J. K. (2019). Psychosocial risk factors for suicidality in children and adolescents. *European Child & Adolescent Psychiatry*, 1-18.

Cashmore, J., & Paxman, M. (1996). *Longitudinal study of wards leaving care.* NSW Department of Community Services.

Centre for Suicide Prevention. (2000). *Children and suicide.* Alert 39.

Chabrol, H., & Saint-Martin, C. (2009). Psychopathic traits and suicidal ideation in high-school students. *Archives of Suicide Research*, *13*(1), 64-73.

Chandler MJ & Lalonde CE. (1998). Cultural continuity as a hedge against suicide in Canada's First Nations. Transcultural Psychiatry, 35, 191- 219 in Aboriginal and Torres Strait Islander Healing Foundation. (2014). *Muru Marri - A resource for collective healing for members of the Stolen Generations: Planning, implementing and evaluating effective local responses*. Kingston, ACT: Aboriginal and Torres Strait Islander Healing Foundation. https://healingfoundation.org.au/app/uploads/2017/02/Muru-Marri-SCREEN-singles-sml.pdf

Conley Wright, A., Metcalfe, L., Wilkinson, H., & Luu, B. (2020). Young people affected by mental illness: Self-harm, suicide risk or attempt. [Commissioned research for Stronger Communities Investment Unit]. Ch 2 in Priority Vulnerable Populations. Sydney: Research Centre for Children and Families, University of Sydney.

Consultative Council on Obstetric and Paediatric Mortality and Morbidity. (2017). *Victoria's Mothers, Babies and Children*. Victoria State Government. https://www.bettersafercare.vic.gov.au/sites/default/files/2019-05/Mother%27s%20Babies%20and%20Children%20Report%202017_FINAL-WEB.pdf

Dube, S. R., Anda, R. F., Felitti, V. J., Chapman, D. P., Williamson, D. F., & Giles, W. H. (2001). Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: findings from the Adverse Childhood Experiences Study. *Journal of the American Medical Association*, *286*(24), 3089-3096.

Eaddy, M., Zullo, L., Horton, S. E., Hughes, J. L., Kennard, B., Diederich, A., Emslie, G. J., Schuster, L., & Stewart, S. M. (2019). A theory-driven investigation of the association between emotion dysregulation and suicide risk in a clinical adolescent sample. *Suicide & life-threatening behavior*, *49*(4), 928–940. https://doi.org/10.1111/sltb.12472

Enns, M. W., Cox, B. J., & Inayatulla, M. (2003). Personality predictors of outcome for adolescents hospitalized for suicidal ideation. *Journal of the American Academy of Child & Adolescent Psychiatry*, *42*(6), 720-727. https://doi.org/10.1097/01.CHI.0000046847.56865.B0

Evans, R., White, J., Turley, R., Slater, T., Morgan, H., Strange, H., & Scourfield, J. (2017). Comparison of suicidal ideation, suicide attempt and suicide in children and young people in care and non-care populations: Systematic review and meta-analysis of prevalence. *Children and Youth Services Review, 82*, 122-129. doi: 10.1016/j.childyouth.2017.09.020

Felman, A. (2018). *Neuroses and neuroticism: What's the difference?* https://www.medicalnewstoday.com/articles/246608

Fernandez, E. (2006). Growing up in care: Resilience and care outcomes. In R. J. Flynn., P. M. Dudding & J. G. Barber (Eds.), *Promoting resilience in child welfare.* (pp. 131-156). University of Ottawa Press. DOI: 10.2307/j.ctt1ckpc6v.12

Geddes, K., Dziurawiec, S., & Lee, C. W. (2013). Dialectical behaviour therapy for the treatment of emotion dysregulation and trauma symptoms in self-injurious and suicidal adolescent females: A pilot programme within a community-based child and adolescent mental health service. *Psychiatry Journal*, *2013*, *1–10.*

Gil, E., & Bogart, K. (1982). An exploratory study of self-esteem and quality of care of 100 children in foster care. *Children and Youth Services Review, 4(4), 351–363.* doi:10.1016/0190-7409(82)90014-7

Goldston, D. B., Daniel, S. S., Erkanli, A., Reboussin, B. A., Mayfield, A., Frazier, P. H., & Treadway, S. L. (2009). Psychiatric diagnoses as contemporaneous risk factors for suicide attempts among

adolescents and young adults: developmental changes. *Journal of Consulting and Clinical Psychology*, *77*(2), 281-290.

Hallfors, D. D., Waller, M. W., Ford, C. A., Halpern, C. T., Brodish, P. H., & Iritani, B. (2004). Adolescent depression and suicide risk: association with sex and drug behavior. *American Journal of Preventive Medicine*, *27*(3), 224-231. doi: 10.1016/j.amepre.2004.06.001

Hammerton, G., Mahedy, L., Mars, B., Harold, G. T., Thapar, A., Zammit, S., & Collishaw, S. (2015). Association between maternal depression symptoms across the first eleven years of their child's life and subsequent offspring suicidal ideation. *PloS one*, *10*(7), e0131885, doi: 10.1371/journal.pone.0131885

Harvey, J. (2006). Report Card on Education 2006. *Education of Australian Children and Young People in Care,* CREATE Foundation.

Hawton, K., Saunders, K. E., & O'Connor, R. C. (2012). Self-harm and suicide in adolescents. *The Lancet*, *379*(9834), 2373-2382.

Higgins, D. J. (2011). Protecting children: Evolving systems. *Family Matters 89,* 5-10. https://aifs.gov.au/publications/family-matters/issue-89

Higgins, D. J., & Katz, I. (2008). Enhancing service systems for protecting children: Promoting child wellbeing and child protection reform in Australia. *Family Matters, 80,* 43-50*.* https://aifs.gov.au/publications/family-matters/issue-80/enhancing-service-systems-protecting-children

Indigenous Psychological Services (2020). *The Westerman Aboriginal Symptom Checklist Youth (WASC-Y)*. https://indigenouspsychservices.com.au/products-tests/wascy/

Irenyi, M., Bromfield, L., Beyer, L., & Higgins, D. (2006). *Child maltreatment in organisations: Risk factors and strategies for prevention (NCPC Issues No. 25)*. National Child Protection Clearinghouse.

Kahsay, E., Magness, C. S., Persky, S., Smith, P. K., & Foster, C. E. (2020). Suicide Prevention Training in the Child Welfare Workforce: Knowledge, Attitudes, and Practice Patterns Prior to and Following safeTALK Training. *Child Welfare, 98*(1).

Kalland, M., Pensola, T. H., Meriläinen, J., & Sinkkonen, J. (2001). Mortality in children registered in the Finnish child welfare registry: population-based study. *BMJ*, *323*(7306), 207-208.

Kaplan, S. J., Pelcovitz, D., Salzinger, S., Mandel, F., Weiner, M., & Labruna, V. (1999). Adolescent physical abuse and risk for suicidal behaviors. *Journal of Interpersonal Violence*, *14*(9), 976-988.

Katz, L. Y., Au, W., Singal, D., Brownell, M., Roos, N., Martens, P. J., ... & Sareen, J. (2011). Suicide and suicide attempts in children and adolescents in the child welfare system. *Canadian Medical Association Journal*, *183*(17), 1977-1981.

Kerr, D. C., DeGarmo, D. S., Leve, L. D., & Chamberlain, P. (2014). Juvenile justice girls' depressive symptoms and suicidal ideation 9 years after multidimensional treatment foster care. *Journal of Consulting and Clinical Psychology, 82*(4), 684.

Kmet, L. M., Cook, L. S., & Lee, R. C. (2004). Standard quality assessment criteria for evaluating primary research papers from a variety of fields. https://era.library.ualberta.ca/items/48b9b989-c221-4df6-9e35-af782082280e

Kools, S., Paul, S. M., Norbeck, J. S., & Robbins, N. R. (2009). Dimensions of health in young people in foster care. *International Journal of Adolescent Medicine and Health*, *21*(2), 221-233.

Krishnaram, A. V., & Devendran, K. V. (2010). Childhood depression with unremitting suicidal behavior. *Indian Journal of Psychological Medicine*, *32*(2), 146–149. https://doi.org/10.4103/0253-7176.78515

Law, K., Khazem, L., & Anestis, M. (2015). The role of emotion dysregulation in suicide as considered through the ideation to action framework. Current Opinion in Psychology. 3. 30-35. 10.1016/j.copsyc.2015.01.014.

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

Leve, L. D., & Chamberlain, P. (2007). A randomized evaluation of Multidimensional Treatment Foster Care: Effects on school attendance and homework completion in juvenile justice girls. *Research on Social Work Practice*, *17*(6), 657-663. doi:10.1177/1049731506293971

Locke, T. F., & Newcomb, M. D. (2005). Psychosocial predictors and correlates of suicidality in teenage Latino males. *Hispanic Journal of Behavioral Sciences*, *27*(3), 319-336.

Long, S. J., Evans, R. E., Fletcher, A., Hewitt, G., Murphy, S., Young, H., & Moore, G. F. (2017). Comparison of substance use, subjective well-being and interpersonal relationships among young people in foster care and private households: a cross sectional analysis of the School Health Research Network survey in Wales. *BMJ Open*, *7*(2). doi:10.1136/bmjopen-2016-014198

Maclean, M. J., Taylor, C. L., & O'Donnell, M. (2016). Pre-existing adversity, level of child protection involvement, and school attendance predict educational outcomes in a longitudinal study. *Child Abuse & Neglect, 51, 120–131.* doi:10.1016/j.chiabu.2015.10.026

Mars, B., Burrows, S., Hjelmeland, H., & Gunnell, D. (2014). Suicidal behaviour across the African continent: a review of the literature. *BMC Public Health*, *14*(1), 606.

Mars, B., Heron, J., Crane, C., Hawton, K., Kidger, J., Lewis, G., ... & Gunnell, D. (2014). Differences in risk factors for self-harm with and without suicidal intent: findings from the ALSPAC cohort. *Journal of Affective Disorders*, *168*, 407-414.

Martin, G., Richardson, A. S., Bergen, H. A., Roeger, L., & Allison, S. (2005). Perceived academic performance, self-esteem and locus of control as indicators of need for assessment of adolescent suicide risk: implications for teachers. *Journal of Adolescence*, *28*(1), 75-87.

Maunders, D., Liddell, M., Liddell, M., & Green, S. (1999). *Young people leaving care and protection*. National Youth Affairs Research Scheme, Hobart.

McDowall, J. (2018). *Out-of-home care in Australia: Children and young people's views after five years of national standards.* Create Foundation.

McKee, M., & Shkolnikov, V. (2001). Understanding the toll of premature death among men in eastern Europe. *The BMJ*, *323*(7320), 1051-1055.

Mendes, P. (2012). Examining the health and mental health care needs and experiences of a group of young people transitioning from out of home care in rural Victoria. *Communities, Children and Families Australia, 6*(1), 30-42.

Neacsiu, A. D., Fang, C. M., Rodriguez, M., & Rosenthal, M. Z. (2017). Suicidal Behavior and Problems with Emotion Regulation. Suicide and Life-Threatening Behavior, 48(1), 52–74. doi:10.1111/sltb.12335

Nemtsov A. (2003). Suicides and alcohol consumption in Russia, 1965-1999. *Drug and alcohol dependence*, *71*(2), 161–168. https://doi.org/10.1016/s0376-8716(03)00094-2

Nock, M. K., Green, J. G., Hwang, I., McLaughlin, K. A., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2013). Prevalence, correlates, and treatment of lifetime suicidal behavior among adolescents: results from the National Comorbidity Survey Replication Adolescent Supplement. *JAMA Psychiatry*, *70*(3), 300-310.

NSW Child Death Review Team (2015). *Child death review report 2015*. NSW Government Publication. https://www.ombo.nsw.gov.au/__data/assets/pdf_file/0009/39474/CDRT_review_report_2015_final.pdf

O'Connor, R. C., Rasmussen, S., Miles, J., & Hawton, K. (2009). Self-harm in adolescents: self-report survey in schools in Scotland. *The British Journal of Psychiatry*, *194*(1), 68-72.

Osborn, A. & Delfabbro, P. H. (2006). *A national psychosocial analysis of children and young people with significant emotional and behavioural problems in Australian out-of-home care.* University of Adelaide.

Osteen, P. J., Lacasse, J. R., Woods, M. N., Greene, R., Frey, J. J., & Forsman, R. L. (2018). Training youth services staff to identify, assess, and intervene when working with youth at high risk for suicide. *Children and Youth Services Review, 86,* 308-315.

Patton, G. C., Coffey, C., Sawyer, S. M., Viner, R. M., Haller, D. M., Bose, K., ... & Mathers, C. D. (2009). Global patterns of mortality in young people: a systematic analysis of population health data. *The Lancet*, *374*(9693), 881-892.

Pears, K. C., Kim, H. K., & Fisher, P. A. (2008). Psychosocial and cognitive functioning of children with specific profiles of maltreatment. *Child Abuse & Neglect*, *32*(10), 958–971. https://doi.org/10.1016/j.chiabu.2007.12.009

Pilowsky, D. J., & Wu, L. T. (2006). Psychiatric symptoms and substance use disorders in a nationally representative sample of American adolescents involved with foster care. *The Journal of Adolescent Health*, *38*(4), 351–358. https://doi.org/10.1016/j.jadohealth.2005.06.014

Posner, K., Brent, D., Lucas, C., Gould, M., Stanley, B., Brown, G., ... & Mann, J. (2008). Columbia-suicide severity rating scale (C-SSRS). *Columbia University Medical Center*, *2008*.

Price-Robertson, R., Rush, P., Wall, L., & Higgins, D. (2013). Rarely an isolated incident: Acknowledging the interrelatedness of child maltreatment, victimization and trauma. *CFCA Paper no. 15*. Melbourne: Australian Institute of Family Studies. https://aifs.gov.au/cfca/publications/rarely-isolated-incident-acknowledging-interrelatedn

Queensland Family & Child Commission. (2016a). *Annual Report 2015 — 16: Queensland Family and Child Commission.* The State of Queensland. https://www.qfcc.qld.gov.au/sites/default/files/Annual%20Report/Annual%20report_complete_290916.pdf

Queensland Family & Child Commission. (2016b). *Annual Report: Deaths of children and young people, Queensland, 2017–18.* The State of Queensland. https://www.qfcc.qld.gov.au/sites/default/files/QFCC_Child_Death_Annual_Report_2017-18.PDF

Rukundo, G. Z., Kemigisha, E., Ocan, M., Adriko, W., & Akena, D. H. (2018). A systematic review of the risk factors for suicidal ideation, suicidal attempt and completed suicide among children and adolescents in sub-Saharan Africa between 1986 and 2018: protocol for a systematic review of observational studies. *Systematic Reviews*, *7*(1), 230. https://doi.org/10.1186/s13643-018-0901-8

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

Sawyer, M. G., Carbone, J. A., Searle, A. K., & Robinson, P. J. (2007). The mental health and wellbeing of children and adolescents in home-based foster care. *Medical Journal of Australia, 186*(4), 181–184.

Sigfusdottir, I. D., Asgeirsdottir, B. B., Gudjonsson, G. H., & Sigurdsson, J. F. (2013). Suicidal ideations and attempts among adolescents subjected to childhood sexual abuse and family conflict/violence: The mediating role of anger and depressed mood. *Journal of Adolescence*, *36*(6), 1227-1236.

Soole, R., Kõlves, K., & De Leo, D. (2014). Suicides in Aboriginal and Torres Strait Islander children: analysis of Queensland Suicide Register. *Australian and New Zealand Journal of Public Health, 38*(6), 574–578.

Stewart, S. E., Manion, I. G., Davidson, S., & Cloutier, P. (2001). Suicidal Children and Adolescents With First Emergency Room Presentations: Predictors of Six-Month Outcome. *Journal of the American Academy of Child & Adolescent Psychiatry*, *40*(5), 580–587. https://doi.org/10.1097/00004583-200105000-00018

Tarren-Sweeney, M., & Hazell, P. (2006). Mental health of children in foster and kinship care in New South Wales, Australia. *Journal of Paediatrics and Child Health, 42*(3), 89-97.

Thompson, M. P., Ho, C. H., & Kingree, J. B. (2007). Prospective associations between delinquency and suicidal behaviors in a nationally representative sample. *Journal of Adolescent Health*, *40*(3), 232-237.

Thompson, R., Proctor, L. J., English, D. J., Dubowitz, H., Narasimhan, S., & Everson, M. D. (2012). Suicidal ideation in adolescence: Examining the role of recent adverse experiences. *Journal of Adolescence*, *35*(1), 175-186.

Tishler, C. L., Reiss, N. S., & Rhodes, A. R. (2007). Suicidal behavior in children younger than twelve: a diagnostic challenge for emergency department personnel. *Academic Emergency Medicine*, *14*(9), 810-818.

van der Kolk B. (2000). Posttraumatic stress disorder and the nature of trauma. *Dialogues in Clinical Neuroscience*, 2(1), 7–22.

Wall, L., Higgins, D., & Hunter, C. (2016). *Trauma-informed care in child/family welfare services* (CFCA Paper No. 37). Melbourne: Child Family Community Australia information exchange, Australian Institute of Family Studies. https://aifs.gov.au/cfca/publications/trauma-informed-care-child-family-welfare-services

Wasserman, D., Cheng, Q. I., & Jiang, G. X. (2005). Global suicide rates among young people aged 15-19. *World Psychiatry*, *4*(2), 114-120.

Westerman, T.G (2003). The development of an Inventory to Assess the Moderating Effects of Cultural Resilience with Aboriginal Youth at Risk of Depression, Anxiety and Suicidal Behaviours, PhD thesis, Curtin University

Wolff, J., Thompson, E., Thomas, S., Nesi, J., Bettis, A., Ransford, B., . . . Liu, R. (2019). Emotion dysregulation and non-suicidal self-injury: A systematic review and meta-analysis. *European Psychiatry, 59*, 25-36. doi:10.1016/j.eurpsy.2019.03.004

Zhao, S., & Zhang, J. (2015). Suicide risks among adolescents and young adults in rural China. *International Journal of Environmental Research and Public Health*, *12*(1), 131-145.

Zubrick, S. R., Hafekost, J., Johnson, S. E., Sawyer, M. G., Patton, G., & Lawrence, D. (2017). The continuity and duration of depression and its relationship to non-suicidal self-harm and suicidal ideation and behavior in adolescents 12–17. *Journal of Affective Disorders*, *220*, 49-56.

Appendix

Method for Question 2

Search strategy

To address question two of the review, we performed a systematic review of the literature.

We searched seven electronic databases in June 2020 for peer-reviewed literature related to suicide interventions in out-of-home care populations. The databases included were: MEDLINE, Scopus, PsycINFO, the Social Sciences Index, Web of Science (Core Collection) and Proquest – Sociology Database and the Cochrane Library. After initial searching, we decided not to apply date restrictions to include as much literature as possible. Table A1 outlines the subject heading (index) searches/MesH terms and keywords included. Other search methods included screening abstracts from other sources, such as meta-analyses and systematic reviews, dissertations and theses, and grey literature, and contacting experts in the field.

Inclusion and exclusion criteria

After removing duplicates, we screened the identified literature using Rayyan QCRI. Articles were included if they:

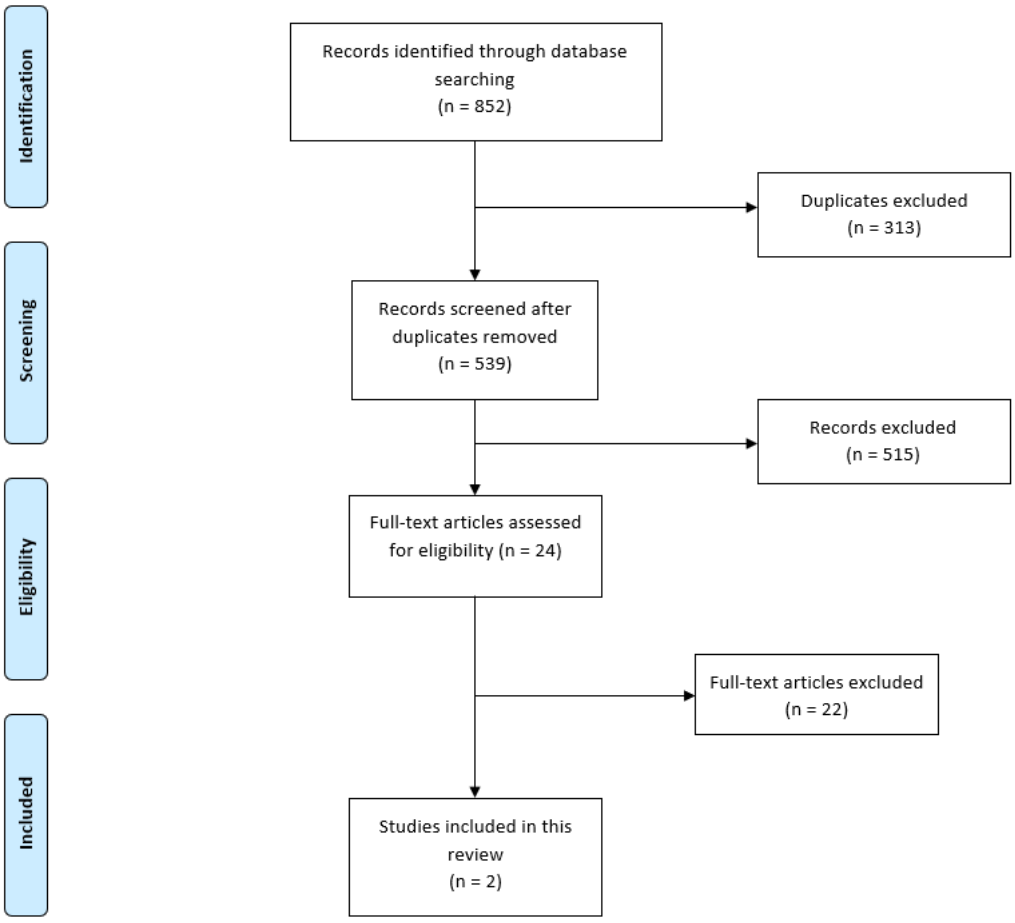
1. evaluated an intervention to reduce suicide
2. were focused on an OOHC population including residential, foster or kinship care
3. measured suicidal thoughts, attempts or completions as part of the outcome measures of the intervention.

Articles were excluded if the target population was not children involved with residential, foster or kinship out-of-home arrangements. For example, many international studies used terms such as 'Residential Treatment Centre' and other such terms not utilised in Australia, which relate to short-to-long term arrangements for children and adolescents identified as exhibiting mental health concerns, who are not part of the child protection system, so were excluded. Articles were also excluded if the was no evaluation of an intervention aimed at reducing suicide, or if the outcome measurement(s) did not include either: (a) suicidal ideation; (b) suicide attempts; or (c) deaths by suicide.

Article selection

Figure A1 shows an overview of the search and screening process. We initially identified 852 articles – 313 of these were duplicates. After duplicates were removed, a total of 539 articles remained. We separately screened the 539 articles with inclusion conflicts being referred to another researcher within the Institute of Child Protection Studies. After article conflicts were resolved there remained a total of 24 studies to be then fully screened and have data extracted. We randomly allocated 12 separate studies each between one another, and extracted data, excluding studies during this process that did not fit the inclusion criteria. Of the 24 studies, 2 studies fit the inclusion criteria at the end of this process.

Figure A1. Graphical representation of the search and screening process



Analysis

We conducted independent quality assessments of the two included studies using a quality assessment criteria developed by Kmet et al. (2004) for evaluating primary research papers from a variety of disciplines. In analysing the studies, we considered the methodology, the measurement outcomes, the intervention evaluated, and the findings of the study. For quantitative studies, these include whether the study design was appropriate; sufficient description of participant (and comparison group); and whether analyses were appropriate and controlled for confounds. For qualitative studies, these include clear description of data collection methods and analysis; connection to a theoretical framework; and whether conclusions were supported by the results. Domains are rated using the terms 'yes', 'partial', 'no', and 'n/a'. We used a data extraction spreadsheet based on the Cochrane Public Health Group Data Extraction and Assessment Template. Considering the extracted data and the quality assessment scoring, an assessment was presented on the effectiveness of the suicide interventions evaluated in the studies.

Table A1. Search terms used

	Out-of-home care	**Suicide**	**Children**	**Intervention**
Search terms (Title and abstract)	"out-of-home care" OR OOHC OR "looked after" OR LAC OR "looked after care" OR "alternate care" OR "kinship care" OR "foster care" OR "residential care" OR "group home*" OR "child welfare"	Suicid*	Child* OR adolescen* OR teen* OR youth OR "young adult*" OR "young people" OR "young person"	interven* OR prevent* OR therap* OR reduc* OR "behavio?r modification" OR treat* OR program*

	Out-of-home care	Suicide	Children	Intervention
Index/MesH terms e.g PsycINFO	((ZU "residential care institutions") or (ZU "residential facilities") or (ZU "residential treatment")) or ((ZU "foster care") or (ZU "foster children") or (ZU "foster home care") or ("group homes"))	"suicide, attempted" or (ZU "suicide, completed") or (ZU "suicidology")) or ((ZU "suicidal ideation") or (ZU "suicidality"))	((ZG "childhood (birth-12 yrs)") or (ZG "preschool age (2-5 yrs)") or (ZG "school age (6-12 yrs)")) or ((ZG "adolescence (13-17 yrs)"))	DE "Crisis Intervention" OR DE "At Risk Populations" OR DE "Crisis Intervention Services" OR DE "Suicide Prevention" OR DE "Early Intervention" OR DE "Intervention" OR DE "Mental Health Services" OR DE "Suicide Prevention Centers" OR DE "Treatment" OR DE "Prevention"