



10 Year Longitudinal Evaluation of the Spilstead Model of Milieu Intervention

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Abstract

Although international research has defined best-practice intervention for children from vulnerable families as integrated and comprehensive, limited implementation and longitudinal evaluation of this approach has been conducted. The Spilstead Model (SM) of early years milieu intervention provides a uniquely integrated one stop shop model of care incorporating a comprehensive range of best-practice programs within a trauma-informed approach. Results from an initial evaluation involving 23 families (mean child age 3.7 years) indicated large effect size improvements 12 months post entry in family functioning as well as child development and emotional wellbeing (ES 0.8 -1.46, $p < 0.001$). This study aimed to evaluate the sustainability of these outcomes for both children and families via follow-up of the initial study co-hort 10 years post the initial evaluation. The study targeted families who participated in the original evaluation. Clinician and parent-rated adolescent measures paralleled the original assessments of parent, child and family functioning. Qualitative evaluation was also conducted via a semi-structured interview with parents. 83% of the original sample participated. Mean youth age was 13.2 years. Results indicated sustained improvements in parent-child relationship, child-wellbeing and reduction of parent stress with large effect size (1.14 – 1.92 $p < 0.001$). On average 73% of the adolescents scored within the normal range on each measure of functioning. Few had repeated school grades or been suspended. None had been arrested. Emerging themes from the qualitative evaluation confirmed the value of the integrated model. The results further support the value of the one stop shop Spilstead Model and have the potential to inform international policy and practice.

Keywords Early intervention · Children at risk · One stop shop

Children from “vulnerable families” (Mullen, 2012) are at risk due to poor attachment, abuse, neglect and lack of stimulation in the early years (Amaya-Jackson, 2016; Felitti et al., 1998; Felitti, 2009; Gilbert et al., 2015, Zarnello, 2018). Although international research has defined best-practice intervention as integrated and comprehensive, truly integrated single governance approaches to service delivery are rarely found in clinical practice (Oberklaid et al., 2013; Shonkoff & Phillips, 2000). Even more limited is research specifically evaluating integrated models of service delivery in the short term and sustainability of outcomes for both children and families over time (Jha, 2016). This lack of research

compromises the potential for policy makers and funding organisations to make informed decisions when targeting services for the most vulnerable.

The Spilstead Model (SM) of early years milieu intervention provides a uniquely integrated one stop shop model of care incorporating a comprehensive range of best-practice programs within a trauma-informed approach. Results from an initial evaluation involving 23 families indicated large effect size improvements 12 months post entry in family functioning as well as child development and emotional wellbeing (Gwynne et al., 2009). This study aimed to evaluate the sustainability of these outcomes for both children and families via follow-up of the initial study co-hort 10 years post exit from the service.

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Literature Review

The negative impact of early childhood adverse experience on long term life outcomes is well understood (Amaya-Jackson, 2016; Felitti et al., 1998; Felitti, 2009; Gilbert

et al., 2015; Zarnello, 2018). There is now a large body of evidence that has consistently confirmed Felitti's (2009, p. 131) statement that "what happens in childhood—like a child's footprints in wet cement—commonly lasts throughout life. Time does not heal; time conceals" (Anda et al., 2006; Brown et al., 2010; Clarkson Freeman, 2014; Flaherty et al., 2013; Lambert et al., 2017; Oh et al., 2018; Shonkoff et al., 2012). Children who are exposed to Adverse Childhood Experiences (ACEs) including social disadvantage, maltreatment, parental mental health problems, substance abuse or domestic violence are more likely to develop both physical and psychological problems later in life (Amaya-Jackson, 2016; Anda et al., 2006; Brown et al., 2010; Clarkson Freeman, 2014; Felitti et al., 1998; Felitti, 2009; Flaherty et al., 2013; Gilbert et al., 2015; Lambert et al., 2017; Oh et al., 2018; Shonkoff et al., 2012; Zarnello, 2018). They are pre-disposed to disease, neuro-developmental disorders, school failure, conduct problems and psychiatric illness (Anda et al., 2006; Briggs-Gowan et al., 2006; Brown et al., 2010; Clarkson Freeman, 2014; Varese et al., 2012; Flaherty et al., 2013; Gilbert et al., 2015; Lambert et al., 2017; Mayo et al., 2017; Oh et al., 2018; Shonkoff et al., 2012). Advances in neurology, epigenetics and behavioural science have further provided an understanding of the aetiology and neurobiological mechanisms underlying this developmental emergency in terms of the impact of parental stress and disrupted attachment on the infant's brain architecture (Bucci et al., 2016; Fox et al., 2010; Gaskill & Perry, 2012; Hambrick et al., 2020; Lupien, 2009; Perry, 2005; Shonkoff et al., 2014; Shonkoff, 2012). Studies of toxic stress indicate that antenatal and early childhood trauma can alter multiple neurological circuits and systems including the Limbic-Hypothalamus-Pituitary-Adrenal Axis, the Amygdala mediated fear response and the neuro-endocrine immune circuitry (Bucci et al., 2016; Hambrick et al., 2019; Meaney, 2010; Perry, 2009). Indeed, Shonkoff et al. suggest that "many adult diseases should be viewed as developmental disorders that begin early in life" (2012, p. 232). As a result children exposed to early parental stress, maltreatment associated with abuse and neglect, or chronic trauma such domestic violence and poverty are more likely to experience delayed development, neuro-developmental disorders such as ASD and ADHD, behaviour issues and long-term health problems (Anda et al., 2006; Briggs-Gowan et al., 2006; Brown et al., 2010; Clarkson Freeman, 2014; Varese et al., 2012; Flaherty et al., 2013; Gilbert et al., 2015; Lambert et al., 2017; Mayo et al., 2017; Oh et al., 2018; Shonkoff et al., 2012). It is important at this juncture to note that neuro-diversity and behaviour issues are also prevalent in the non-vulnerable community.

In response to this evidence, services are commonly designed to target "vulnerable families" although this term's validity has been questioned. Mullen (2012) laments the absence of a single approach to the definition of vulnerability and Bauer and Wieszorek (2016) note that this means of categorising families is "extremely ambivalent" (2016, p. 1). The need for consensus regarding terminology and an individualised approach to work with families has been emphasised (Bauer & Wieszorek, 2016; Golden et al., 2012). In the context of the Spilstead Model and this study the most relevant definition of "vulnerability" and the target population is that outlined by Mullen (2012) which relates to that "most obvious in clinical practice" (Mullen, 2012, p. 1). This definition includes "families with low incomes, young parent families, sole parent families, families from culturally and linguistically diverse communities, families with a parent who has a disability, and families experiencing problems with housing, domestic violence, substance abuse, mental health or child protection" (Deep End Paper, 2010). This target group includes families experiencing both intergenerational trauma and current trauma (Amaya-Jackson, 2016; Perry et al., 1995).

The evidence-base in relation to effective intervention for children from this group of families is indeed robust (Liming & Grube, 2018). Targeted support for these vulnerable families via professional home visiting is widely recognised as effective in improving both parent and child wellbeing (Doyle, 2017; Heckman et al., 2017; Howard & Brooks-Gunn, 2009; Lowell et al., 2011). The Nurse-Family Partnership (NFP) program which has now provided services to more than 200,000 families in 43 states across the U.S. is the most cited program with proven benefits. This community health program targets new young single mothers and their infants. Specially trained nurses provide weekly home visits focusing on two primary goals: keeping the children safe and improving the lives of the mothers (Olds et al., 1998). The four decades of randomized control trial conducted for this program has demonstrated positive changes with regards to home environment, parenting attitudes, and maternal mental health for parents of both boys and girls at age two years (Olds et al., 2019). Improved cognitive skills for both boys and girls, enhanced early socio-emotional skills for girls at age six years and sustained social-emotional improvements particularly for boys to age twelve years have also been recorded (Heckman et al., 2017). Specific programs targeting the parent-child relationship such as Parent Child Interaction Intervention (PCIT) have also demonstrated proven benefits for vulnerable children aged two to seven years in terms of social/emotional development. A meta-analysis including 23 studies and 1144 participants found PCIT to have large effect size outcomes across multiple measures including parent-related and child-related stress as well as child behaviour (Thomas et al., 2017).

The most profound and long-lasting benefits however have been associated with programs which offer centre-based early childhood education interventions, rather than home-visiting or case-based services (Wise et al., 2005). The High Scope Perry Preschool Project (PPP), implemented in Ypsilanti Michigan in 1962, provided 58 preschool children from low SES families who had IQ scores between 70–85, with intensive small group early education plus weekly teacher home-visits (Schweinhart, 2000; Schweinhart et al., 2005; Schweinhart & Weikart, 1990; Schweinhart & Weikart, 1997). Analysis involving 35 years of data following participants to the age of 40 years has indicated that although the program did not mitigate sustained gains in IQ, highly significant and lasting changes were effected in “character skills” resulting in reduced aggressive, antisocial and rule-breaking behaviour (Heckman et al., 2013). These improvements in social/emotional development had positive impacts on education, economic, health and social outcomes with a resultant annual return on investment of between 7 and 10% (Heckman et al., 2010; Nores et al., 2005). Similarly, the Abecedarian project in Chapel Hill North Carolina from 1972 to 1977, offered disadvantaged children an educational day-care intervention between the ages of 6 weeks and school entry (Campbell & Ramey, 1995; Campbell et al., 2002, 2012). Experimentally evaluated “life-cycle benefits” of the program have indicated exceptional and sustained benefits in education, earnings, general adult health and reduced crime for participants in their mid-30s with a baseline rate of return at 13.7% (Barnette & Masse, 2007; Campbell et al., 2014; Garcia et al., 2017).

Further, the evidence suggests that the most effective approach to intervention is integrated service provision (George & Wiegand, 2019; Oberklaid et al., 2013). Shonkoff and Phillips (2000) stated that “programs that combine child-focused educational activities with explicit attention to parent-child interaction patterns and relationship building appear to have the greatest impact” (p. 244). Carrey et al., (2014, p. 3) observe that “even the most rigorously tested programs with high fidelity (Nurse-Family Partnership) must be part of a comprehensive approach”. Several factors including poor continuity of care across developmental phases, lack of “two generation models” with parallel services for parents and children as well as inconsistent staff qualifications and training have been noted as hinderances to the provision of quality integrated care (Carrey et al., 2014).

Finally, a trauma-based approach is now acknowledged as fundamental to the management of families where there are multiple risk factors and intergenerational stress (Amaya-Jackson, 2016; Hambrick et al., 2019; Perry et al., 1995; Perry, 2009; Shonkoff et al., 2012; Zarnello, 2018). The Neurosequential Model (NM) is internationally valued for the comprehensive trauma-based framework it provides. The neurobiology-informed and developmentally sensitive approach is able to inform clinical problem solving. The model,

developed by Perry (2006, 2014) and Perry and Dobson (2013a, b) is not designed as a specific therapeutic technique or intervention but rather a tool to guide case planning for clients who have experienced early childhood trauma and their families. Evidence has emerged regarding the value of this “bottom-up” approach which targets neuro-developmental organization commencing from the lowest level of identified impairment (Hambrick et al., 2018, 2020; Perry, 2015; Perry & Dobson, 2013a, b).

Despite these strong indications that comprehensive integrated support for families across multiple domains of trauma-informed intervention is likely to result in optimal outcomes, there continues to be surprisingly limited research conducted evaluating programs offering this model of care (George & Wiegand, 2019). The Centre for Independent Studies highlighted the scarcity of evaluations which examine the impact of intervention via standardised outcome measurement and the absence of long-term program evaluation. It was noted that this makes it impossible to “determine which programs are effective, let alone generate benefits in excess of their costs” (Jha, 2016, p. 19). McLuckie et al. (2019) identified “5 pillars of direct practice for children 0–5 at risk for experiencing mental disorders” (p. 12) each with similar aims for children, parents and families however noted limited efforts toward integration or co-ordination of these programs and interventions.

The Dalwood Spilstead Service (DSS) functions as a tertiary unit of the Northern Sydney Local Health District (NSLHD), in Sydney Australia. The service provides intervention and support for vulnerable families and children at risk in collaboration with the NSW Child Protection service across the following service streams:

1. Step Up Family Support Services
2. The Brighter Futures Family Preservation Service
3. Family Restoration
4. Out Of Home Care

Client families are referred from health and welfare professionals as well as the NSW child protection service. Families referred present as vulnerable according to the above definition with both parental issues (ie mental illness, substance abuse, domestic violence, social isolation, Aboriginal or refugee background) and children who are experiencing social, emotional and developmental delays/disorders. These families demonstrate a multiplicity of both parent and child risk factors plus early indicators of poor childhood resilience. In response to international evidence the single governance Spilstead Model (SM) of early years milieu intervention, was first designed in 2005 (Gwynne et al., 2020). The single governance, one stop shop, milieu approach which is unique in Australia enables a seamless continuum of care for families moving between the four afore mentioned child protection streams.

The service is able to support up to ninety families at any time from a multidisciplinary team including eighteen full time equivalent positions across nine disciplines. The team includes psychologists, and clinical psychologists as well as social workers, occupational therapists, speech pathologists, art therapists, early childhood educators and early childhood teachers, administration and support staff.

The SM integrates a comprehensive range of evidence-based interventions for vulnerable families and children at risk within a trauma-informed and relationally sensitive therapeutic milieu (Mahoney et al., 2009; Thomas et al., 2002; Walker, 1994). The SM combines case management and parent support including parent counselling, home visiting, discreet father services, and parent-child attachment interventions for parents with multi-disciplinary centre and home-based early childhood education and development programs for children, in an environment of family centred and strength-based practice. In order to further enhance trauma-informed practice the DSS was certified in the Neuro-sequential Model Network (NMN) through the Child Trauma Academy USA at the Phase I level in 2013 then at the advanced Phase II (Train The Trainer) level in 2016 (Gwynne et al., 2020). In addition to the core SM components noted below the DSS has since been able to offer NM of Therapeutics (NMT) assessments for both parents and children in order to further inform case management.

Families co-design a package of services tailored to meet the individual needs of both parents and children from the following service components:

1. Family Services:
 - (a) Allocation of a Family Counsellor to provide case management, professional home visiting and counselling for parents.
 - (b) Trauma-informed adult assessment.
 - (c) Fathers / Men's Program
 - (d) Parent Self-Care, Regulation and Support programs.
 - (e) Parenting Education Programs
 - (f) Volunteer Home Support Program
 - (g) Consumer co-design via a Parents In Action Group and an Aboriginal Advisory Group
 2. Child Development Services:
 - (a) Allocation of an Early Childhood Educator to case manage the needs of each child.
 - (b) Trauma informed child assessment and case planning.
 - (c) Home-based Early Childhood Education and Early Intervention
 - (d) Infant Supported Playgroups
 - (e) The Spilstead Therapeutic Preschool
 - (f) Outreach education services to mainstream preschools and schools.
 - (g) Allied Health Therapy Services including Speech Pathology, Occupational Therapy, Clinical Psychology and Art Therapy
3. Parent/Child Interaction Interventions:
 - (a) Parent/Child Interaction Groups
 - (b) Attachment focused Parent/Child Interaction interventions including Parent Child Interaction Therapy (PCIT) and Watch Wait and Wonder (WWW) programs.

This one stop shop (French et al., 2006; Hetrick et al., 2017; Jha, 2016; Ovreteit, 2011) model is unique in ensuring a holistic approach with health, welfare and education services for both parents and children provided under one service umbrella and from the one team. Services are provided from the single governance team at a location most suited to the family's needs and can be home-based, centre-based or via outreach to schools or preschools. This enables optimum engagement with families and ensures maximum co-ordination and consistency of service delivery (Arney & Scott, 2010; Ensher & Clark, 2011; Pote et al., 2019). Practice evidence has demonstrated that those in most need often do not navigate, engage or progress well in siloed services which are short-term and solution focussed (Ensher & Clark, 2011; Hilferty et al., 2010). In fact, the additional stress associated with locating & enlisting help can exacerbate rather than alleviate the regulation and relational challenges experienced by adults and children who have been exposed to trauma. The service system itself can set some client families up to fail. (Ensher & Clark, 2011; Roggman et al., 2008).

In contrast, the single team SM allows the creation of a therapeutic milieu of trauma-informed responsive, regulating and relational care (Mahoney et al., 2009; Thomas et al., 2002; Walker, 1994). Acknowledging that it is unrealistic to expect that parents who have experienced a lifetime of abuse and fear of authority would trust and "comply" with professional's recommendations in a short period of time, the SM allows time for clinicians to be able to develop a relationship with the family at their own pace. The professional team is also more able to earn the family's trust when they are able to promptly respond to the family's needs with an individually tailored intervention. (Landy & Menna, 2006; Roggman et al., 2008). This timely responsiveness is made possible by the availability of a smorgasbord of programs and interventions from a well co-ordinated and supported multi-disciplinary team with an expansive range of skills.

This single integrated team approach is designed to enhance relational health for the family by providing multiple

calm, predictable, co-regulating relationships for both parents and children (Perry, 2005, 2015; Perry & Dubson, 2013a, b). A well trained and supported team has the potential to facilitate responsive, regulating and relational care with multiple opportunities for co-regulation, rupture and repair and the promotion of emotional resilience for both generations in the family (Landy & Menna, 2006; Pote et al., 2019; Roggman et al., 2008). Figure 1 is a graphic representation of the SM.

The independent evaluation of the NSW Brighter Futures program conducted by the Social Policy Research Centre in 2010 identified the SM in Northern Sydney as achieving superior results in family engagement and retention and family goal achievement compared with other Brighter Futures programs across the state (Hilferty et al., 2010). These positive comparative results have persisted throughout the history of the SM involvement in the Brighter Futures program. Data from the 2019–2020 contract period indicated that the SM had a 96% engagement and participation rate with families referred from the child protection service, 33% higher than the 63% state-wide average. Of the families who participated in the SM version of the Brighter Futures service, 86% of families completed the program with family goals achieved, 33% more than the state average of 53% (Gwynne et al., 2020). These higher participation and achievement rates indicate that 83% of the families referred to the SM version of the Brighter Futures service completed the program with goals achieved compared to the state average of 33%.

The independent evaluation of the NSW Brighter Futures program also highlighted the cost effectiveness of the SM with a greater range of services provided by the DSS than the average at a lower cost (Hilferty et al., 2010). The cost benefits of this integrated single governance approach have persisted. Findings over time indicate that the single governance approach combining the provision of health, welfare and early education services for the family has advantages in administrative efficiency and productivity. The comprehensive SM program outlined above which includes the provision of a therapeutic preschool for children between the ages of 12 months to six years, plus intensive allied health and counselling services for both parents and children is currently costed at \$23,700 per family per annum. This compares favourably with other Brighter Futures programs which offer a more limited key worker home visiting model at a cost of \$21,800 per family per annum. A review commissioned by the NSW Ministry Of Health and conducted by Oxford University concluded that the SM represented an advance in child protection services in NSW, and that it should be extended more widely across NSW and Australia (Melhuish, 2014).

An initial evaluation of the SM involved 23 newly referred families who participated in the intervention over a 12-month period. The sample included 24 children with a mean age of 3.7 years. The core components of the SM

included: 1) family support provided by an allocated family counsellor who co-ordinated services for parents, including individual parent counselling, and group programs; 2) allocation of an early childhood educator to address each child's developmental needs with intervention provided in the home for children under 2 years and via enrolment in a therapeutic preschool program for children aged 2–6; 3) regular professional home visiting; 4) parent-child interaction interventions, and 5) specialist medical and allied health therapies (Gwynne et al., 2009; Wise et al., 2005).

Results from the 12-month pre-post research revealed significant improvements on measures of parent/child interaction, parenting stress, parental satisfaction, parent confidence, parental capacity, family interactions, child well-being and total family functioning with large effect size changes (ES 0.73–1.67, $p < 0.01$). Parents also reported improvements on the Child Behaviour Checklist in regard to levels of withdrawal, attention and aggression problems, as well as internalising and externalising behaviours (ES 0.73–1.46 $p < 0.001$). 71% of children who presented on initial developmental screening with delays in the clinical range, were found to be within the normal range on post testing. 41% moved from the below average range to scores within the normal range in language development (Gwynne et al., 2009).

It has only remained therefore to demonstrate that these outcomes achieved for children and families who participated in the SM service are sustainable in the absence of further support. The current study's 10-year follow-up of the initial pilot cohort was designed to provide important and timely longitudinal information as to whether the positive outcomes of this integrated and comprehensive model of early intervention could be sustained over time.

Method

The study targeted all 23 participant families from the original cohort which included 24 children under 6 years. Conducted in collaboration with the School of Psychology at the Charles Sturt University, NSW, ethics approval for the study was obtained from the university Human Research Ethics Committee, with the researchers blinded to the results of the original study. Parents of children from the original study were invited to participate in the current study with written consent obtained. In each case the parent who had completed the questionnaires from the original study also completed the follow-up measures and interview. Standardised and norm-referenced data was collected via measures of both individual adolescent and family functioning which paralleled those used in the pilot. These tools included parent, teacher and adolescent rated measures as well as clinician rated measures.

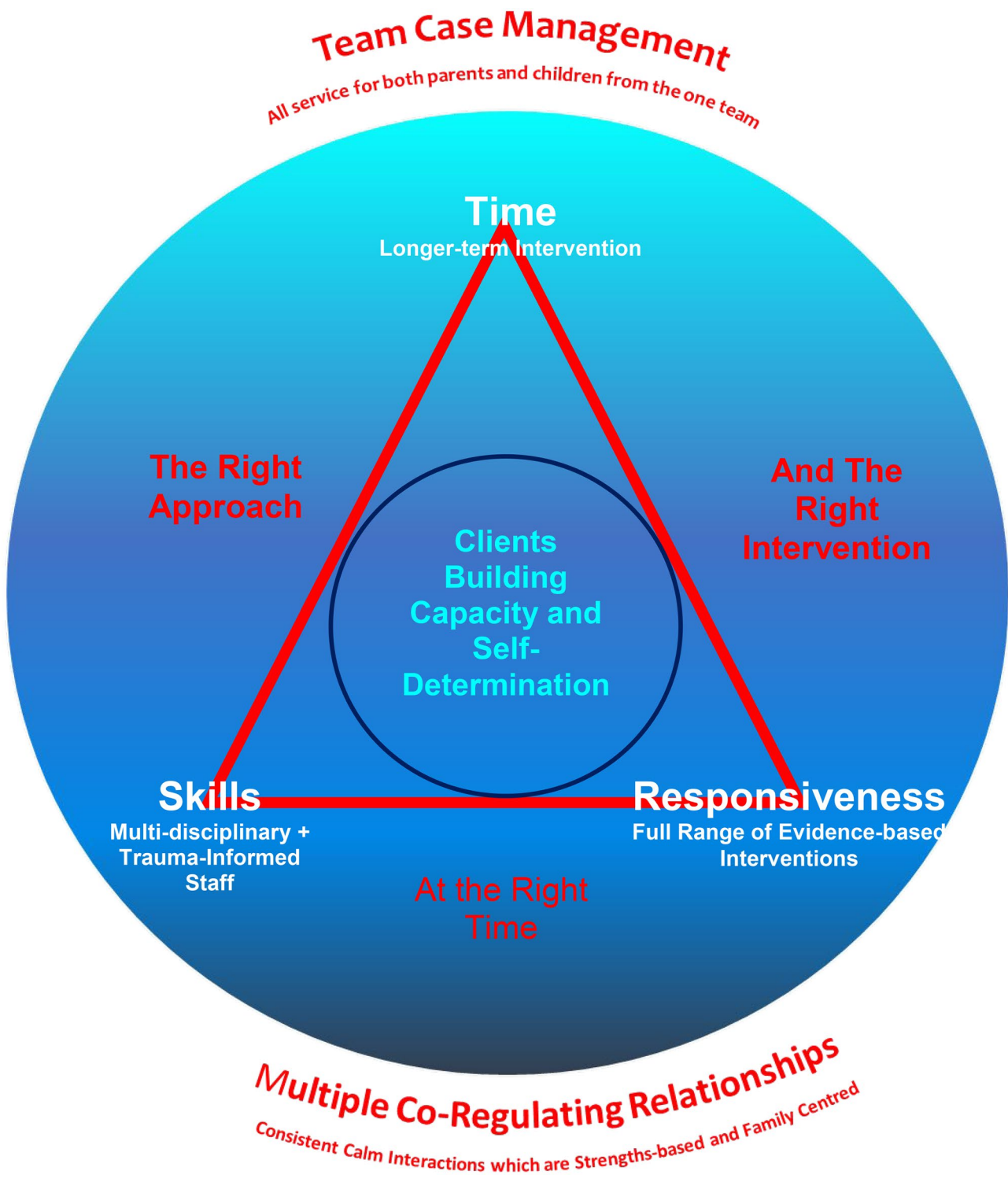


Fig. 1 The Spilstead Model Of Milieu Intervention

Table 1 provides an overview of the variables measured and the corresponding methods of data collection for both studies. Only the Environment and Child Well-being domains of the Northern Carolina Family Assessment Scale were included

in the follow-up due to limited information available regarding other domains. Statistical analyses were completed using a combination of SPSS version 20.0 (IBM, 2011) and Excel for analysis of clinical significance (Agnostinis et al., 2008).

Table 1 Summary of outcome measures used in original study and follow-up study

Variables	Outcome Measured	Pilot Study Measure	Follow-up Study Measure
Parent/Family Functioning	1. Parent Sense of Competence	1. Being A Parent Scale	1. Being A Parent Scale (BAP)
	2. Parenting Stress and Relationships	2. Parent Stress Index Short Form	2. Stress Index for parents of Adolescents (SIPA)
	3. Family Functioning	3. Northern Carolina Family Assessment Scale. (NCFAS)	3. Northern Carolina Family Assessment Scale: Environment and Child Well-being Domains only
Adolescent Well-being	1. Social, Emotional and Behavioural Functioning	1. Child Behaviour Checklist. (CBCL)	1a. Child Behaviour Checklist – Parent report 1b. Youth Self Report (YSR) 1c. Teacher Report Form (TRF)
	2. Developmental / Educational Status	2. Brigance Developmental Screen	2. Semi-structured Interview (SI)
		2. CELF / PLS-4	

A semi-structured interview with the young person's primary carer, was recorded and transcribed. This interview included a standard set of questions related to demographics plus education and schooling (repetition of grades, suspensions, special education services, and extracurricular activities), criminal activity, physical and mental health, use of drugs or alcohol, engagement with other services and psychosocial stressors in the past 10 years. These interviews also gathered general information regarding the current functioning of the child and family.

In addition to investigating the contextual reality of the client's situation over the past 10 years, this qualitative methodology enabled exploration of the parent's experience of the SM. In particular, questions attempted to identify which aspects of the service were experienced as critical to the family's progress. Research questions therefore included:

1. what was the parent's experience of receiving services from DSS
2. what aspects of the service did they describe as being most helpful
3. was there an identification of a specific service they found made a difference to them and their child that may not have been accessed otherwise.

Statistical Analysis

A series of repeated measures ANOVA's with post hoc comparisons using Bonferroni's adjustment were undertaken to investigate the differences in mean scores for scales with overlapping scores across the three time points. The multivariate partial eta squared (η^2) statistic was reported as a measure of the effect sizes (ES) of the ANOVA's. The degree of change from pre-intervention to follow-up was analysed for co-variation between scores. This ES was

calculated using Cohens *d* where M1 and M2 referred to pre-intervention and 10-years post intervention means, and SD1 and SD2 referred to their respective standard deviations (Cohen, 1969, 1988).

Tests of clinical significance were used to determine the degree of meaningful change experienced by the participants and their families. The Jacobson and Truax (JT) method including the Reliable Change Index (RCI) was deemed the most appropriate measure of clinical significance given its recommended routine use in child and adolescent mental health services. (Chomycz & Schmidt, 2015; Jacobson & Truax, 1991). For ease of reporting the results of analyses, all pre-intervention statistics are referred to as Time 1 (T1), post-intervention as Time 2 (T2) (data from initial study) and 10 years follow-up as Time 3 (T3).

A thematic analysis (Braun & Clarke, 2006) was conducted on the transcripts of the interviews collected. Braun and Clarke outline a 6 phase framework for thematic data analysis; namely familiarisation, coding, identifying themes, reviewing themes in light of the whole data set, defining themes, and finally write up integrating the analytic narrative with data excerpts and existing literature. A semantic approach was adopted, where themes representing a "level of patterned response or meaning within the data set" (Braun & Clarke, 2006, p. 82) were identified within the explicit or surface meanings of the data, and subsequent interpretation and analysis theorised the significance of these themes and implications for practice.

Results

19 of the 23 families (83%) from the original co-hort participated in the 10-year follow-up study. 20 families were located and all families contacted agreed to participate. One family later withdrew due to parent illness. The adolescents

Table 2 Demographic Characteristics of Follow-up Sample and History of Intervention n = 19

Demographic Characteristic	Detail	n	%
Age	12 yrs	5	26.32
	13 yrs	7	36.84
	14 yrs	5	26.32
	15 yrs	2	10.53
School Grade	Year 6	1	5.26
	Year 7	5	26.32
	Year 8	8	42.11
	Year 9	5	26.32
No. Years Child Attended DSS Preschool	1	8	42.11
	2	10	52.63
	3	1	5.26
No. Years Family Received DSS Family Support	1	6	31.58
	2	5	26.32
	3	4	21.05
	4	4	21.05

included 17 males and 2 females with ages ranging from 12 to 15 years (mean 13.2 years). Further demographic details are outlined in Tables 2 and 3.

Children presented with a range of developmental and mental health diagnoses pre-intervention. Smaller proportions of children were reported to have current diagnoses at the 10-year follow-up. The retained diagnoses at follow-up included Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD), however the proportion of participants presenting with features of ADHD had halved since pre-intervention.

The effects size of change between mean T1 and mean T3 scores for all measures of parent and family functioning

were scored in the moderate to large range (as displayed in Table 4). Large effects size scores were retained on measures of parent efficacy, child-wellbeing, total parenting stress and parent-child relationship (ES:1.02–1.92). Variance in the data, however, impacted the analysis of statistical significance. For parent self-efficacy and environment domains the difference was only significant between T1 and T2 scores. As not all measures were returned by participants as fully completed, final numbers for each analysis varied.

82.35% of participant families were rated on the NCFAS as living in home environments above the baseline score at T1. An improvement to > 92% at T2 was noted to have been sustained at T3. At T1 only 29.41% were rated on the Child-Wellbeing domain as above baseline, however a sustained improvement to 75% of participants was noted at T3. Figure 2 illustrates the sustained improvements in mean t-scores over time.

RCI analysis of the SIPA results indicated that 79.92% of parents reported a sustained clinically significant reduction in Total Stress scores at T3 compared to T1 while 15.38% noted increased stress levels. Clinically significant improvements in Parent/child Relationship from T1 to T3 were also found for 68.75% of participants while 12.50% noted deterioration.

Parental reports of social, emotional, and behavioural problems continued to be lower 10 years post intervention. As illustrated in Fig. 3, the majority of participants at T3 fell within the normative range on all adolescent domains of the SIPA.

CBCL T-score results shown in Fig. 4 indicate large and moderate effects size differences between mean T1 and T3 T-scores for the Externalising and Total Problem scales at 0.93 and 0.66 respectively. The mean CBCL T-scores for T3 are consistent with pilot study results in T2. The weakest result was noted on scores of Internalising behaviour with a low effect size at 0.23 recorded between T1 and T3.

Table 3 Summary Of Parent/Family and Child Characteristics T1 and T3 n = 19

Parent / Family Factors	Child Factors		
Parent / Family Factors T1 2005	Child / Adolescent Diagnosis		
n (%)	Initial ^a n (%)		
	F/U ^b n (%)		
DOCS managed child protection concerns	9 (47%) Behaviour Disorder	15 (79%)	1 (5%)
Parent with mental illness	9 (47%) Autism Spectrum Disorder	7 (37%)	5 (26%)
Parent with D&A problem	6 (32%) Attention Deficit/Hyperactivity Disorder	10 (53%)	5 (26%)
Recent history / current DV	9 (47%) Global Developmental Delay / Intellectual Disability	10 (53%)	3 (16%)
Isolated single parent	9 (47%) Mood Disorder	14 (74%)	1 (5%)
Parent with learning difficulties	3 (16%) Language Disorder	17 (90%)	0 (0%)
Severe parenting difficulties	16 (84%) Motor Delay	9 (47%)	0 (0%)
CALD – culturally and linguistically diverse background	4 (21%)		
ATSI – Aboriginal / Torres Strait Islander background	2 (11%)		

DOCS Department of Community Services, D&A Drug and Alcohol, DV domestic violence

^aInitial child diagnosis based on Dalwood Spilstead Service medical record data

^b10 year follow-up diagnosis based on parent and teacher report

Table 4 Means and Standard Deviations for Measures of Parent and Family Factors

Measure	Domain	N	Mean (SD)			<i>d</i>
			T1	T2	T3	
Being A Parent Scale	Parent satisfaction	11	3.62 (1.25)	4.36 (1.02)	4.59 (1.23)	0.78
	Parent Efficacy	11	4.05 (1.31)	5.22 (0.85)	5.29 (1.11)	1.02
Northern Carolina Family Assessment Scale	Child-Wellbeing	14	-0.79 (0.98)	0.64 (0.75)	0.50 (1.29)	1.14
	Environment	12	0.58 (1.00)	1.17 (0.84)	1.25 (1.14)	0.63
Stress Index for Parents of Adolescents	Total Parent Stress	13	88.92 (10.76)	61.62 (31.84)	55.31 (24.28)	1.92
	Parent-child Relationship	16	85.75 (14.54)	59.69 (25.71)	57.69 (24.95)	1.42

Figure 5 summarises results from all measures of adolescent behaviour. According to all informants, the majority of participants (> 63%) at T3 fell within the normative range on each domain of the Child Behaviour Checklist, Youth Self Report and Teacher Report Form measures. On average 73%

of the participating adolescents were found to be functioning within the normative range.

Current educational status and life outcome information collected via the semi-structured interviews and TRF qualitative data is recorded in Table 5. Only 10% of the young

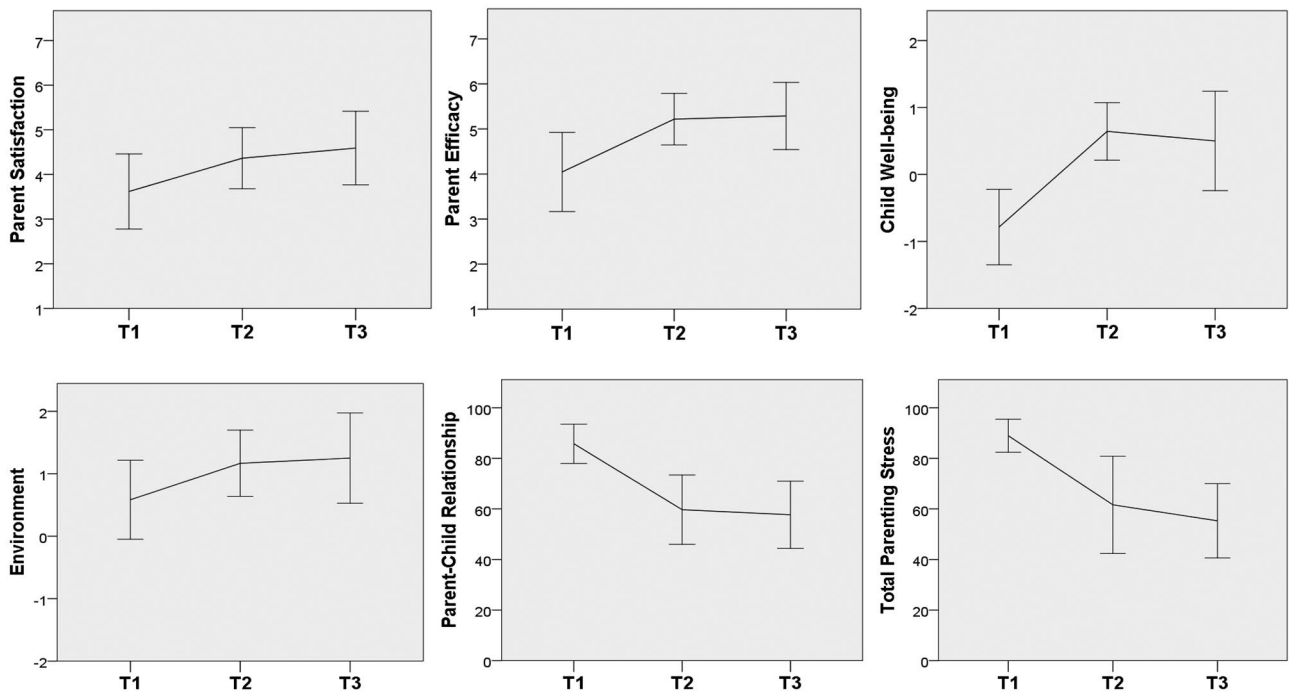


Fig. 2 Changes in mean scores across time on measures of parent and family functioning. n = 19. Error bars represent 95% confidence intervals

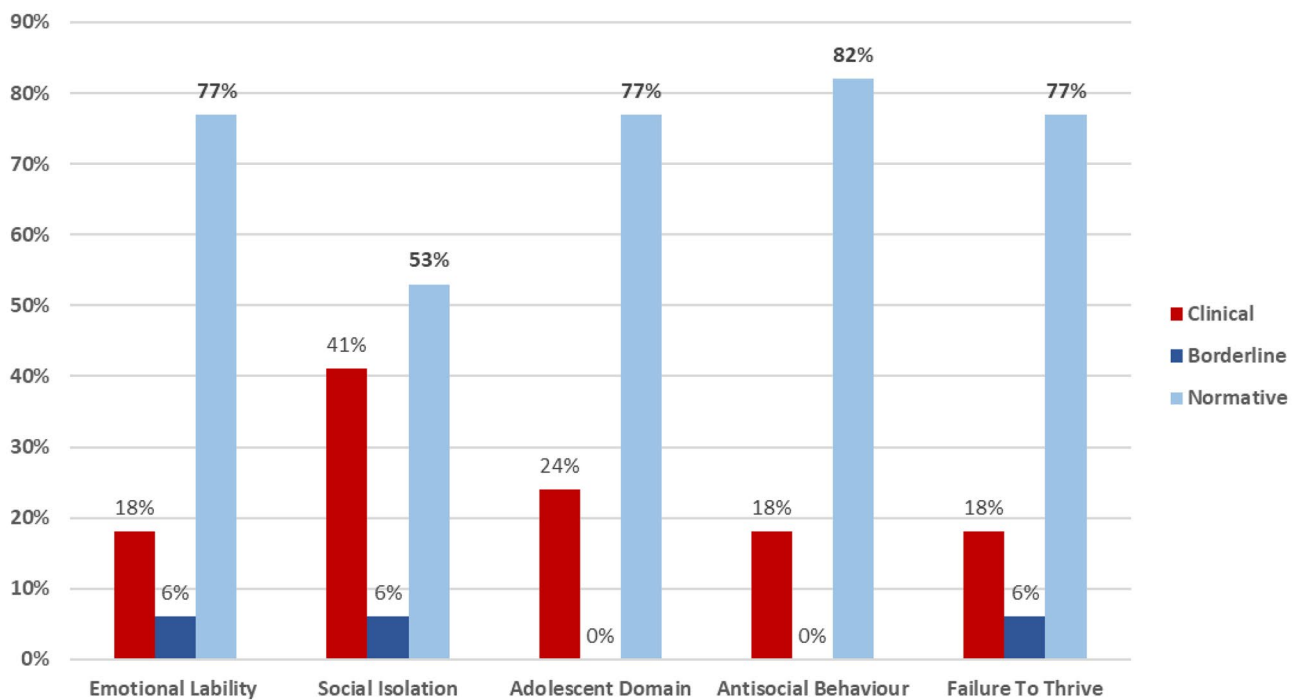


Fig. 3 Results at T3 on the Stress Index for Parents of Adolescents $n = 17$

people at follow-up reported repeating school grades and less than 33% had been suspended from school. None had been arrested or involved in the juvenile justice system.

19 semi-structured parent interviews were completed although four were unable to be transcribed due to technical issues with recording equipment. Results from the thematic analysis of the remaining 15 transcribed interviews indicated two primary themes regarding the client experience. One reflected the parent's experience of the SM and the second identifying the specific value of the Speech Pathology services.

Qualitative Theme One: The Spilstead Model The value of the unique model of service delivery as a one stop shop, incorporating a range of educational, welfare and therapy services for parents and children and the provision of team case management in a strongly inclusive, family-centred and relational environment was identified as the dominant emerging theme from the evaluation. This theme relating to the overall SM was broadly grouped into 3 subthemes including the one stop shop model of care, the co-ordinated whole family wrap around support and the relational environment.

One Stop Shop Model of Care A strong theme emerged of the significant benefits parent's experienced from the one stop shop approach in all 15 parent interviews. The ability to access support for themselves and their children from the one team was noted to positively impact coordination

of care, cost effectiveness, and the access to services and therapies otherwise unaffordable or difficult to engage due to competing demands of family life and circumstance. Parent quotes included:

- (before DSS) “I was trying to take him to all these early intervention – all these different people.... It was a disaster. And so his behaviour was really difficult and when he came here it just started to shift very quickly ... he was just more settled.”
- “The thing that the children had access to everything ... speech therapy, OT, everything was in one place ...”

Coordinated, Whole Family Support The value of a coordinated model of care, and a team-based case management model providing support for both parents and children from the one team was a strong theme noted by many parents:

- “I was getting the support as well, and the support that I got was enormous. I met other mothers with children with behavioural problems so I could understand that I wasn't alone, so it was a lot of support with me feeling like I could cope more.”
- “There's no point having a place like this just helping the children, you've got to have the both, you just can't have one. Amazing – it was a lifeline for us. I hate to think about where I would be without that 3 years here.”

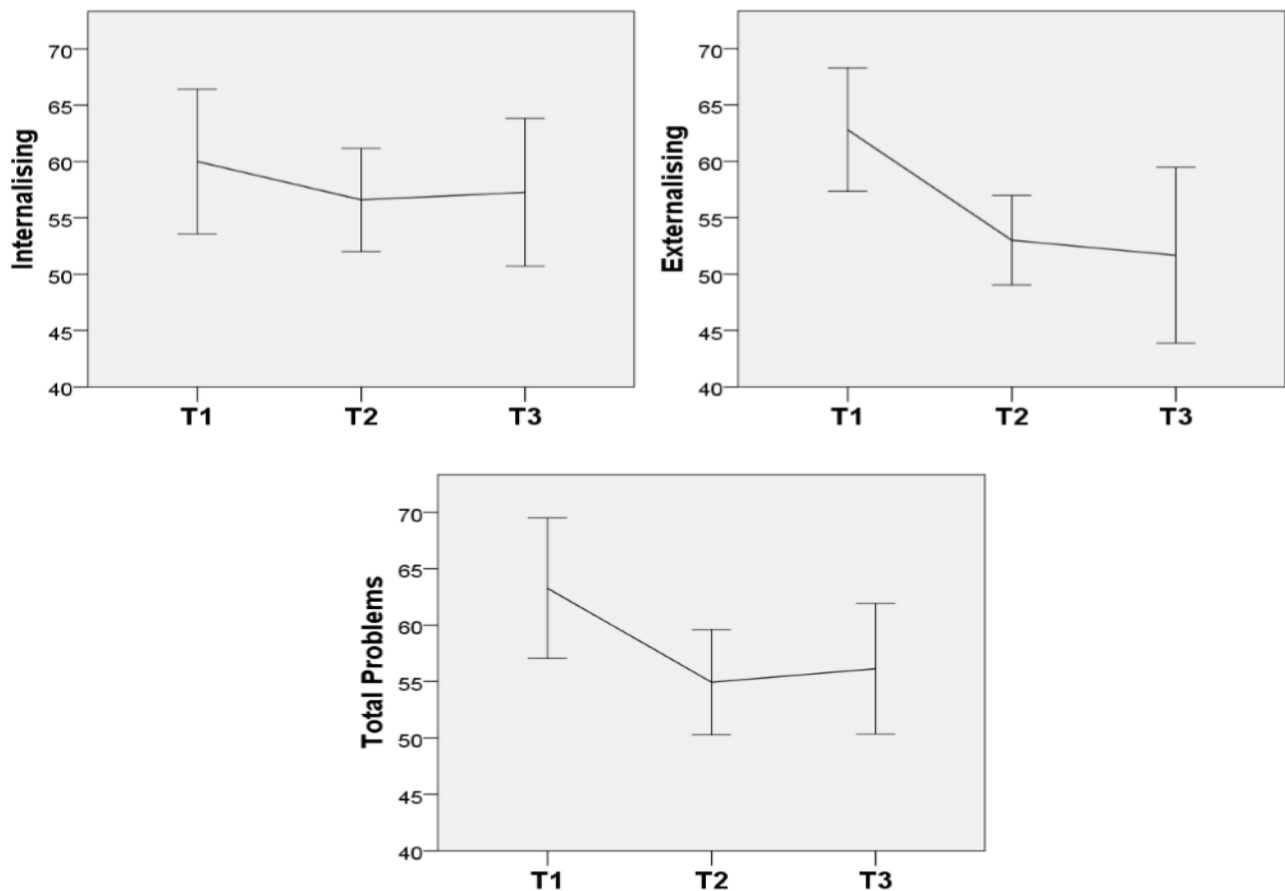


Fig. 4 Changes in mean T-scores across time on subscales of the CBCL based on parent report. Error bars represent the 95% confidence intervals. $n = 17$

- “I needed desperate help, and we didn’t know where to go. It was not just providing the child service, but the whole family.”

Relational Environment Parents commented positively on the safe and accepting environment plus the sense of belonging and being understood that they felt within the service:

- “It’s so encompassing and supportive, gives you so much information and structure and you know they really hold your hand the whole time and really prop you up. It’s a very safe place to be, it’s important for the family and kids.”
- “Having other adult people around, to know that you weren’t on your own, because its lonely at home.”

Qualitative Theme Two: Access to Speech Pathology Services The value and impact of seamless access to speech pathology service emerged as the second strong theme, with 13 of the 15 participants commenting positively on the speech pathology service offered at DSS. Parents

consistently commented on the value of accessibility and affordability of the service, the regular provision of intensive therapy, the positive impact of speech therapy on speech and language development, and on their child’s behaviour and self-confidence.

Several parents mentioned an awareness of their child’s need for speech pathology support prior to entry to DSS, but described the challenges of accessing services, often compounded by challenging family circumstances. Many noted difficulties accessing services due to affordability of private services, service restrictions in the CYFH service for school age children, and the impact of family functioning on the ability to follow through with appointments and home therapy recommendations.

- “I knew R was delayed because he didn’t talk, so I knew that was a problem, but we tried very hard to get him into any sort of speech pathology but dept. health only gave children with speech problems once every 3 months and then if you miss that appointment because

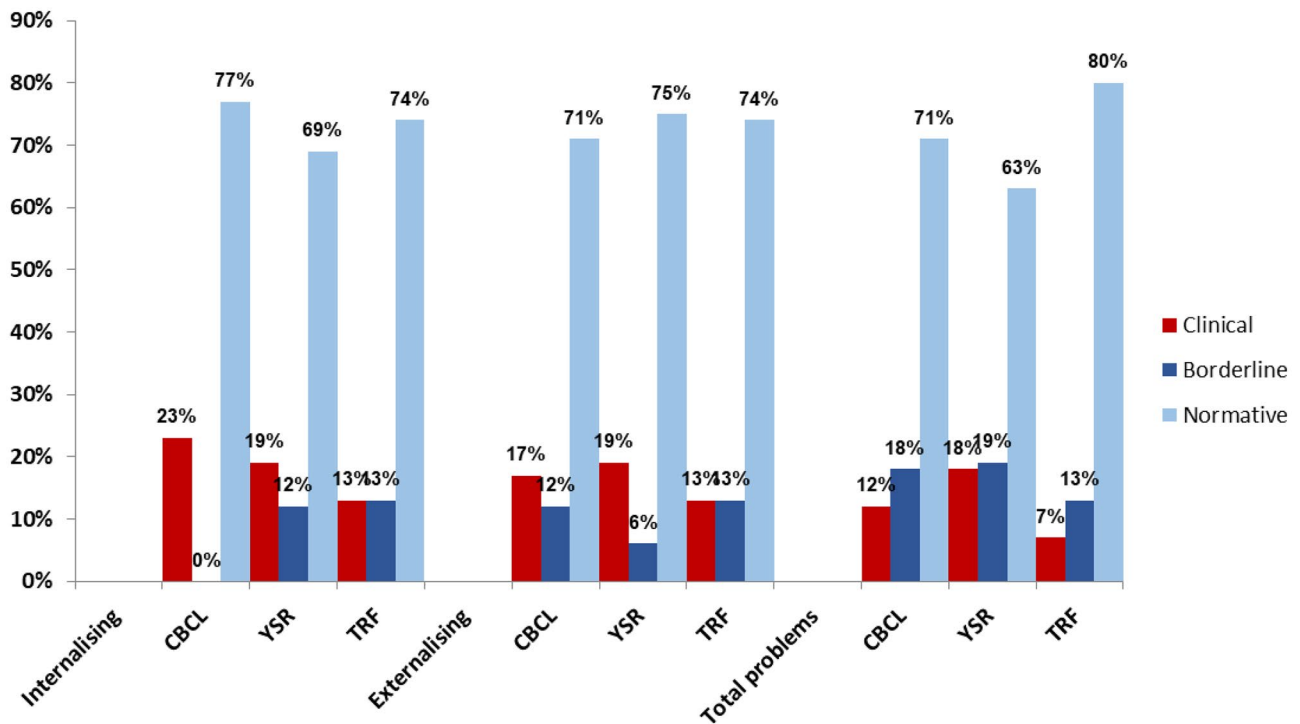


Fig. 5 Results at T3 on the Child Behaviour Checklist, Youth Self Report and Teacher Report Form, Norm Referenced Assessments n = 19

your child was sick, you get put back in the queue and it would be 6 months before you got another appointment”

- “I had to drop the whole lot to look after him, so it was very very difficult and I was trying to take him to all these early interventions – all these different people, the speech pathologist – I’d go – it was a disaster.... And so his behaviour was really really difficult and when he came here it started to shift very quickly... he was just more settled”
- ‘finding E was quite delayed ... it was like a snowball effect. I was just dealing with him and 3 kids under four.. and when you find out all this information and you have to start doing speech and occupational therapy for him, I was like Oh my god!’”

The value of speech pathology services being integrated into the therapeutic preschool and that therapy was offered regularly were common comments by many parents as it made the service accessible to children and more manageable for parents:

- “they had access to the speech therapy, the OT, everything was in one place when they were in kindy... Z was taken out of the classroom for half an hour and do his speech therapy and then come back ... I thought that was a really good part of the service as well”
- “Being on my own I would have to go to work and then I would have to pick him up and then take him to speech therapy or occupational therapy... and so when the centre

Table 5 Educational and Behavioural Outcomes based on Parent and Teacher Report n = 19

Repeated a grade	Number	%	Number	%	Number	%	Number	%
	2	10.53						
Special education	None		Brief		1–3 years		All of Schooling	
	7	36.84	6	31.58	1	5.26	5	26.32
Suspended from school	Never		Once or twice		3 or more times			
	13	68.42	4	21.05	2	10.53		
Arrested or charged	0	0.00						
Involvement with Juvenile Justice	0	0.00						
Use of drugs or alcohol	0	0.00						

was able to get the funding to have in house therapy, that was just a huge weight off my shoulders ... that would have started him off going in the right direction”

Conclusions

This study confirms that the gains achieved for children and parents who participated in the SM of early years milieu intervention were sustained over a 10-year period and that the longitudinal outcomes for the children into adolescence were extremely positive. Group mean results in Total Parenting Stress and Child-Parent Relationship were sustained over time with large and statistically significant effect size scores. These gains in parent functioning may have mitigated the development of further problems for the adolescent children.

Indeed, these longer-term outcomes contradict the expected trajectory for children from families with this level of vulnerability, with multiple informants indicating that despite the presence of complex developmental and emotional disorders during early childhood, the vast majority of adolescents were functioning at follow-up within the normal range on all psychometric measures of social, emotional and behavioural functioning. Data collected from parents and teachers also indicated remarkable rates of resolved issues relating to behaviour, mood, language and global development.

The limitations of this study relate primarily to those of the original evaluation. Greatest of these is the threat to internal validity posed in the absence of a control comparison. This limits conclusive discussion regarding elements of the results. Whilst research suggests that early problems in emotion dysregulation, externalising and internalising persist in the absence of intervention, the contribution of the SM of early years milieu intervention to the improved wellbeing of participants, cannot be concluded definitively. Further research utilising a randomised control trial design is needed to confirm that these results extend beyond the longitudinal outcomes of a single cohort. The high participation rate of families in the study (83%), however lends strength to the results.

Further economic analysis, and comparison with an identified control group, would also be required to facilitate a comprehensive cost-benefit analysis of the SM. This would allow the magnitude of the net benefits of the program for participants, their families and the broader society to be assessed. Given the existing literature on the return on investment for early intervention programs and the evidence of sustained improvement in the current study the return on investment to any government and community from the SM program is, however, likely to be substantial. The higher participation and achievement rates revealed via the Brighter Futures state-wide data collection, where 83% of the families

referred to the SM completed the Brighter Futures program with goals achieved compared with a state average of 33%, at a minimum indicate value for money invested.

There are a number of core components which combine to explain the success of this model. Firstly, the single governance approach which enables a seamless continuum of care for families moving between all streams of the child protection sector. It is possible for one organisation to provide a one stop shop, with the majority of health, education and welfare services for both parents and children provided from the one team. Partnerships, consortiums and interagency collaborations can be difficult, resource intensive and personality dependent. This holistic nature of the SM organisational structure has huge advantages in administrative efficiency and productivity, continuity of service delivery and containment for vulnerable and often chaotic families. This single governance, one stop shop approach reduces the barriers faced by families in accessing multiple and integrated services. This, in itself, has the potential to reduce parental stress and its associated negative impacts on children.

Secondly, timely access to the full range of evidence-based interventions including professional home visiting, parent-child interventions and therapeutic centre-based early childhood education allows for responsive and individualised case management and service delivery. Indeed, the benefits of combining these three multi-faceted evidenced-based approaches seem to be greater than the sum of their parts. Offering the right approach and the right intervention at the right time for the family builds both service engagement and effectiveness. This requires a skilled, diverse, and well supported multi-disciplinary team with the flexibility to deliver home, centre and outreach services.

Finally, the trauma-informed relational milieu provided by the co-ordinated team approach can contribute to the overall relational health of the family. A cohesive multi-disciplinary team can optimise the therapeutic alliance and create a stable platform of co-regulated care from which families can feel safe enough to step out and make their own movements towards change. This relational support and co-regulation are further enhanced when the full continuum of care for families is provided by the one team. It is relationally more supportive when the counsellor who is there to help the family move into a refuge is the same counsellor later able to offer PCIT when the family is ready.

In essence, this SM approach is able to create a platform of trauma-informed care upon which each of the three key evidence-based interventions can be provided according to the family's individual needs within a relationally sensitive therapeutic milieu. It is possible that the synergistic nature of the SM which combines the full range of best-practice interventions including professional home visiting, parent-child interaction therapy, therapeutic centre-based early childhood education and allied health intervention within

a trauma-informed relational approach is able to facilitate a cumulative program effect which has advantages in both effectiveness and cost efficiency.

This Australian first 10-year follow-up study of a trauma-informed one stop shop and milieu model of intervention for children at risk supports the international evidence regarding the sustained benefits of integrated, comprehensive and multi-faceted services. The findings further support the case for wider provision of single governance evidence-based intervention services for children in need, and endorse the recommendations of Prof. Melhuish (2014) regarding the expansion of the Spilstead Model.

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Data Availability Raw data were generated at the Northern Sydney Local Health District. Derived data supporting the findings of this study are available from the corresponding author (K.G) on request.

Declarations

Conflict of Interest The authors declare that they have no conflict of interest.

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