Designing, testing, and implementing a sustainable nurse home visiting program: right@home

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Nurse home visiting (NHV) offers a potential platform to both address the factors that limit access to services for families experiencing adversity and provide effective interventions. Currently, the ability to examine program implementation is hampered by a lack of detailed description of actual, rather than expected, program development and delivery in published studies. Home visiting implementation remains a black box in relation to quality and sustainability. However, previous literature would suggest that efforts to both report and improve program implementation are vital for NHV to have population impact and policy sustainability. In this paper, we provide a case study of the design, testing, and implementation of the right@home program, an Australian NHV program and randomized controlled trial. We address existing gaps related to implementation of NHV programs by describing the processes used to develop the program to be trialed, summarizing its effectiveness, and detailing the quality processes and implementation evaluation. The weight of our evidence suggests that NHV can be a powerful and sustainable platform for addressing inequitable outcomes, particularly when the program focuses on parent engagement and partnership, delivers evidence-based strategies shown to improve outcomes, includes fidelity monitoring, and is adapted to and embedded within existing service delivery systems.

Keywords: nurse home visiting; implementation; evaluation; retention rates; quality; randomized controlled trial

Introduction

The experience of sustained socioeconomic and psychosocial adversity during the early years of life has wide-ranging and long-lasting negative consequences, such as poorer health, reduced education, and lower income well into adult life. Early childhood provides a window of opportunity for service providers and governments to prevent these long-term negative effects. Families with fewer socioeconomic resources often experience significant barriers accessing health and support services, and this contributes to and exacerbates poor outcomes for their children. The fact that families with the greatest needs are the least able to access health and support services (the inverse care law) may explain the persistence of health inequities among children in developed countries such as the United States, UK, Canada, New Zealand, and Australia.

Cost seems the most obvious explanation why some families do not access services that are likely to benefit them. However, even in countries with essentially free universal health care (e.g., Canada, UK, and Australia), families experiencing socioeconomic disadvantage, as well as those belonging to subgroups known to experience greater adversity such as Indigenous families, ethnic minority families, and families experiencing complex and multiple problems (all referred to herein as “experiencing adversity”), are often less likely to use health care services during pregnancy, and as their children grow up. Service access is a complex process that involves not only cost but...
also a family’s ability to identify its needs, seek out services, reach those services, obtain or use those services, and actually be offered services with the intensity necessary and appropriate to its needs. One way of potentially overcoming the complex web of factors that limit the access to health and other support services for families experiencing adversity is through nurse home visiting (NHV).

Nurse home visiting

NHV is a strategy for delivering a multiplicity of services to families within the home environment over an extended period of time. Home visiting programs are not a single, uniform intervention; rather, they differ in goals, the intensity of services provided, staffing, and the type of families targeted. That said, most of the programs target families with young children (i.e., below the age of five) who are at risk of poor developmental outcomes (e.g., Nurse Family Partnership (NFP/FNP) and Maternal Early Childhood Sustained Home-Visiting (MECHS) program). By focusing on families who could benefit from additional support, home visiting programs attempt to decrease the gap between those in the top socioeconomic level and those at the bottom by preventing the trajectories forged in early childhood that lead to poor outcomes in later life.

The potential benefits of home visiting programs include some that are not always obvious or acknowledged, such as families not having to seek out services or find transport to get to the services. Home visiting programs provide opportunities for observing the environment in which families live, which can help professionals identify a family’s unique needs and provide a greater level of individual attention than typical clinic-based consultations. Home visiting programs also allow qualified professionals to build a rapport with families that may not be possible with other types of interventions—which is especially important for families who may have lost trust in mainstream universal service providers.

A number of home visiting programs have led to improved outcomes for children and families experiencing adversity, including the NFP, Healthy Families America, and Early Head Start. On the strengths of these high-profile successful programs, home visiting has attracted the attention of politicians and policy-makers in the United States, UK, and many other developed nations. In the United States, President Obama’s 2014 Budget proposed $1.5 billion in funding over 10 years (2015–2024) to maintain and expand evidence-based, voluntary home visiting services. In 2015–2016, the UK Government increased the number of places available for the Family Nurse Partnership program to 16,000. However, in the context of the move of community child health services from the UK Government to financially strained local authorities, as well as the lack of demonstrated effectiveness in the UK evaluation of FNP, the number of places is now in decline.

Despite the substantial investment, even the most successful NHV programs have moderate effects in the short term, and mixed benefits in the long term. The context and design of program evaluation may be a key factor in the evidence of effectiveness. Benefits observed in one system (e.g., the United States) may not translate to different service systems with different populations and reach. For example, a recent evaluation of the effectiveness of FNP delivered in England’s broadly based, publicly funded, healthcare setting concluded no evidence of benefit for the primary outcomes versus usual care, that is, smoking in pregnancy, birthweight, emergency hospital attendance and admission for the child, and subsequent pregnancy. In contrast, there was evidence that FNP improved smoking, breastfeeding, and child protection outcomes in a Dutch study. Both countries provide child and family health care services through a system of universal provision.

Few published NHV studies provide sufficient information about program content or implementation processes to identify which components make for an effective program. In the last 15 years in Australia, the only NHV program to be rigorously evaluated is the MECHS program. The findings suggested that NHV has potential for improving children’s learning and developmental outcomes when embedded in Australia’s existing universal systems of care. In particular, the publicly funded child and family health (CFH) nursing service offers a platform for testing NHV within a proportionate universal approach; that is, universal service delivery can be targeted and delivered with sufficient intensity to begin to redress the social gradients in children’s health and development.
In recognition of the substantial adversity experienced by some Australian families, the state governments of Victoria and Tasmania, together with philanthropy, funded a new partnership to develop and evaluate the effectiveness of an NHV program known as right@home. Delivered through the existing universal CFH service, right@home is offered to women experiencing adversity from pregnancy until the children's second birthdays. Tested via randomized controlled trial (RCT, ISRCTN89962120), the program's overarching goal was to improve children's learning and development by school entry.

By child age 2 years, the right@home program was delivered with higher levels of fidelity and retention than seen in NHV programs internationally. There were also beneficial impacts on aspects of parenting and the home learning environment compared with the existing, universal CFH service.

In this paper, we address the existing gaps in documenting the implementation of NHV programs by describing the processes used to develop the evidence-informed program to be trialed, summarizing the effectiveness of the program, and detailing the quality processes and implementation evaluation. As noted by Paulsell and colleagues, “To improve implementation quality, we must systematically measure and examine implementation in applied practice settings” (p.1630). The right@home trial provides an exceptional case in which to explore the relationship between program design and outcome and implementation effectiveness, based in a real-world delivery system (Box 1).

**Stakeholder involvement**

The right@home NHV program and RCT are part of a collaborative partnership that draws on the strengths of three organizations. During the trial implementation, the Australian Research Alliance for Children and Youth (ARACY) acted as project managers, overseeing funding, governance, and reporting; the Translational Research and Social Innovation (TReSI) Group (Western Sydney University) led implementation support for the program; and the Centre for Community Child Health (CCCH) (Murdoch Children’s Research Institute) led the research evaluation. Two aspects of stakeholder involvement underpinned the success of the trial. First, there was strategic stakeholder engagement from the beginning of the process through (1) an independent expert advisory group, (2) relationships with state government policymakers especially in Tasmania where the nurses were employed by the State, (3) ongoing reporting and engagement with philanthropic funders, and (4) contractual arrangements with Local Government in Victoria to enable the nurses to be employed through ARACY. This meant the end-users were involved with and championed the program from the outset. Second, the partnership model allowed for an arm’s length evaluation of the intervention through a separate research organization. These arrangements facilitated the rigor and success of the project and laid the foundations for further implementation. Funding for the right@home project was provided by the state governments of Victoria and Tasmania, the Ian Potter Foundation, Sabemo Trust, Sidney Myer fund, the Vincent Fairfax Family Foundation, and the National Health and Medical Research Council (NHMRC, 1079418). right@home was approved by the Human Research Ethics Committees of The Royal Children’s Hospital (HREC 32296); Peninsula Health (HREC/13/PH/14); Ballarat Health Services (HREC/13/BHSSJOG/9); Southern Health (HREC 13084X); Northern Health (HREC P03/13) in Victoria, Australia; and The University of Tasmania (HREC H0013113), Tasmania, Australia.

**Program development process**

In designing the right@home program, we purposefully looked beyond the current popular and political appeal of home visiting to determine how to make home visiting programs as effective as possible across multiple policy contexts. It could have been possible to select an existing home visiting program that had been deemed effective from a resource such as the Home Visiting Evidence of Effectiveness site (HOMVEE https://hmovee.acf.hhs.gov/). However, it was necessary to determine what makes these programs work—the features and processes of home visiting programs that are likely to bring about the desired outcomes—as a means of determining whether a custom made home visiting program may be a better option.

The development process began with three literature reviews that addressed the overarching question: What features of NHV programs are likely to bring about improved learning and development outcomes for young children? The original intention was not to undertake three literature
Box 1.

What is already known
- Nurse home visiting (NHV) is a targeted model of service delivery provided from pregnancy through the first 2 years of a child’s life and has the potential to redress inequities for children raised by families experiencing socioeconomic and psychosocial adversity.
- There have been mixed results in previously published NHV programs, although a number have led to improved outcomes for children and women both in the short and long term, with small-to-moderate effect sizes and variable outcomes across the world.
- Although outcomes are well reported, implementation data are often omitted or poorly reported and, when reported, are variable; efforts to both report and improve program implementation are vital for NHV to have population impact and policy sustainability.

What this study adds
- We provide a case study of the design, testing, and implementation of an Australian NHV program and randomized controlled trial; the program was delivered with high levels of fidelity and retention, and the RCT demonstrated beneficial impacts across the primary outcome areas by child age 2 years.
- We demonstrate that NHV can be a powerful and sustainable platform for addressing inequitable outcomes for women and children. This is particularly so when the program focuses on parent engagement and partnership, delivers evidence-based strategies shown to improve outcomes, includes fidelity monitoring, and especially is adapted to and embedded within existing service delivery systems. These mechanisms have relevance for successful implementation of effective early childhood program interventions.

reviews (only one); however, the findings of the first highlighted the need to conduct a second review with a different focus (What factors are associated with successfully working with families experiencing adversity?)\(^\text{38}\) which highlighted the need to do a third (What evidence-based interventions—focusing on the primary outcome domains—could be effectively delivered through NHV programs?)\(^\text{43}\). For each of the three reviews, Table 1 summarizes the topic, findings, integration into program logic, and outcomes assessed. The findings from all three literature reviews informed the decisions made by the program developers (health professionals and state government partners with significant knowledge, practical experience, or influence in the field of child health and wellbeing, maternal health, and family health) and the design of the resulting NHV program.

Program logic, content, and delivery

Program logic
One reason for the variable results from NHV programs may be that the measures assessed cover a broad range of child and parent outcomes that are not always explicitly targeted by the intervention. A review by Segal and colleagues of NHV programs designed to reduce child maltreatment found that program logic helped target explicit outcomes and was related to effectiveness.\(^\text{54}\) They noted that the use of program logic was a key feature missing from many trials including those targeting developmental and behavioral outcomes. Noting this, we paid attention to developing a logic model that focused on the right@home aims for children up to 2 years of age (with impacts linked until school entry at age 5 years) (Fig. 1). This involved aligning the evidence around neuroscience, early adversity, and child development, with targeted, evidence-based content (where available) and processes to ensure quality delivery to the identified population within the known service context.\(^\text{55}\)

Outcomes
The program logic was developed to deliver on the a priori determined outcomes. The effectiveness of right@home was first evaluated at the end of program delivery at child age 2 years. At this point,
Table 1. Findings from the three literature reviews and integration with program logic and outcome measurement

| Review topic                                                                 | Findings                                                                                                                                                                                                 | Integration into program logic                                                                                                                                  |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **What features of an NHV program are likely to bring about improved learning and development outcomes for young children?** | Specific details about what makes NHV programs effective are limited. Factors that emerged as important were:                                                                                           | Population characteristics (1. Focus/target):                                                                                                                                                           |
|                                                                               | – delivery by a professionally skilled workforce,                                                                                                                                                    | – recruiting women experiencing high social adversity. In right@home that is ≥2 risk factors, which is higher than the ≥1 risk factor that defined eligibility in MECSH.       |
|                                                                               | – visits commencing in the antenatal period,                                                                                                                                                           | Output (3. Program/activities provided): Using core MECSH framework for right@home: NHV program is a partnership between the family and nurse, focuses on goals that parents prioritize within structure and focus of right@home, builds competencies, is nonstigmatizing, and maintains continuity of care. |
|                                                                               | – visits being offered over a longer period,                                                                                                                                                           | Output (3. Program/activities provided): The following strategies were incorporated into program content:                                                                                               |
|                                                                               | – being offered to families experiencing greatest adversity or complexity.                                                                                                                              | 1. Parental care:                                                                                                                                                                                          |
| **What factors are associated with successfully working with families experiencing adversity (examined via a range of disciplines, e.g., wraparound models and multisystemic therapy)?** | Evidence suggests programs should:                                                                                                                                                                | a. the KidSafe audit of the internal and external safety of the child’s home;                                                                                                                                  |
|                                                                               | – build partnership between the family and nurse,                                                                                                                                                    | b. anticipatory guidance on normal infant sleep and positive bedtime routines from 0 to 6 months, and a behavioral sleep intervention from 6 months onward; and   |
|                                                                               | – focus on goals that parents prioritize,                                                                                                                                                             | c. the “Get up and Grow” healthy eating guidelines.                                                                                                      |
|                                                                               | – build competencies,                                                                                                                                                                                  | 2. Responsivity:                                                                                                                                                                                          |
|                                                                               | – be nonstigmatizing, and                                                                                                                                                                               | d. “Promoting First Relationships” program                                                                                                                                                                 |
|                                                                               | – maintain continuity of care.                                                                                                                                                                           | 3. Home learning environment:                                                                                                                                                                                   |
| **What evidence-based interventions—focusing on the primary outcome domains—could be effectively delivered through NHV programs?** | Findings were mixed. Robust evidence for strategies was available for three focus areas: managing sleeping issues; ensuring safety; and promoting child attachment with a total of 11 recommended strategies for the right@home program. It was possible to identify guidelines for nutrition and eating. There were neither evidence-based practices nor guidelines to support strategies regarding providing appropriate social opportunities, maternal bonding, and managing crying and separation issues. | e. “Learning to Communicate” program, 0–12 months, and                                                                                                                                                    |
|                                                                               | a. the KidSafe audit of the internal and external safety of the child’s home;                                                                                                                            | f. modified “smalltalk” program, 13–24 months                                                                                                         |
|                                                                               | b. anticipatory guidance on normal infant sleep and positive bedtime routines from 0 to 6 months, and a behavioral sleep intervention from 6 months onward; and                                                                                                                                              |
|                                                                               | c. the “Get up and Grow” healthy eating guidelines.                                                                                                                                                     | Nurses used an additional two “process” focus modules—video feedback and motivational interviewing strategies—to help parents instigate behavioral change.                                                                 |

Continued
Table 1. Continued

| Outcome measures | Structural quality monitoring: dose, retention, content, training, and supervision. | Dynamic quality monitoring: Session Rating Scale, Parent Satisfaction Questionnaire, and Parent Enablement Index (details in Protocol). | Content delivery quality: concordance of expected and delivered program. RCT primary outcome measures: 13 outcomes in total including: parent-reported items on sleep, nutrition, and parenting styles drawn from the Longitudinal Study of Australian Children; study-designed items on safety; and in-person interview and assessment of responsibility and the home learning environment using the Home Observation of the Environment Inventory (details in published Protocol).

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The primary aims were to improve three outcome domains, which were chosen as necessary precursors to children’s learning and development. The first domain, parental care, was selected because raising children within a more structured and less chaotic environment (e.g., feeding and sleeping routines) promotes self-regulation, decreases rates of injury, and is related to executive functioning and school success. The second domain, responsibility (or responsiveness), reflects the neuroscience of infant brain development related to emotional attachment; being most rapid in the first 12 months of life and predictive of infants’ ongoing social and emotional development. Parental verbal responsibility is also strongly predictive of children’s vocabulary and language. The third domain, the home learning environment, is known to improve children’s learning and development regardless of socioeconomic status, with research showing that factors like the number of books in the home, and activities like reading stories and recognizing numbers and shapes, independently predict school outcomes. Table 1 includes the primary outcome measures with a reference to the published Protocol for more information.

Inputs

Delivery agents, and training and supervision.

Nurses were recruited from the usual care service through an expression of interest to work in the program and trained to deliver the right@home program: 18 nurses were recruited (7 full-time and 11 part-time) to support 30 families per full-time equivalent nurse. The right@home nurses must be qualified CFH nurses, that is, Baccalaureate-registered nurses (or equivalent) with postgraduate qualifications in CFH. They must also have completed Family Partnership Model Training, which prepares for working in an "explicit model of the helping process that demonstrates how specific helper qualities and skills, when used in partnership, enable parents and families to overcome their difficulties, build strengths and resilience and fulfil their goals more effectively." Program nurses undertook 4 h of online training, 12 h of face-to-face training in the core MECSH program, and an additional 7 h training in the right@home focus modules. Online training was assessed through knowledge competency-based assessment requiring 100% competence. Pre- and postassessment of face-to-face training assesses knowledge and attitudinal competence in
partnership and strengths-based practice, understanding of professional empathy, and confidence and competence in focus module delivery. This training was embedded into practice through a minimum of 3 months of supported reflective practice-based learning using a mix of guided self-reflection as part of the online training and ongoing clinical and reflective practice supervision.

Nurse management and program leadership was provided by the extant governance in each participating service. Each nurse was expected to receive a minimum of 1 h per month of reflective practice group supervision and was ideally facilitated by someone other than the line manager. Reflective practice group supervision focuses on the nurse’s clinical practice. It supports the development of their capacity to reflect on practice and provide home visiting that is effective and safe for both families and the nurse. Individual supervision was also available as needed to support nurses in reflections on practice that were not appropriate for group discussion. In addition, each family was reviewed by the right@home clinical team, and additionally any other clinical professionals relevant to the cases being reviewed, at least once every 6 months. This occurs through scheduled monthly case conference meetings.

Each site had a dedicated social care practitioner, who was a member of the program team. There was one full-time social care practitioner role per 100 families in the program. Social care practitioners in the right@home trial had as a minimum a bachelor’s degree in social work which provides eligibility for membership of the Australian Association of Social Workers. The role of the social care practitioner was to provide support for the nursing team and psychosocial support for the families, such as brief counseling interventions, and instrumental support, including advocating for and assisting families with housing, service access, and financial issues.

The leadership, supervision, and nurse practice were intensively supported by the MECSH Support Service from Western Sydney University which provided and coordinated training and worked to embed right@home practice into usual care processes, while also ensuring the separation of right@home and usual care practice for the duration of the RCT. This process followed core MECSH and adaptation processes\(^5\) and included:

**Figure 1.** The right@home program logic.
assessment of local policies to ensure compatibility with the right@home model; incorporation of the local healthy child program into the visit schedule; developing or enhancing supervisory and case review systems; implementation of a sustainable, web-based data system; and implementation of an ongoing quarterly quality monitoring and feedback system. These processes and practices are documented in a local policy addendum in each state detailing how right@home is implemented in each site. This work was undertaken before implementation, and there were no changes to the program in the right@home RCT. Throughout the trial intervention period, and in ongoing post-trial implementation, a systematic quality monitoring program supports delivery of treatment as planned.

Program content
The right@home program content was structured around the core MECSH framework and program, bolstered by five evidence-based strategies for content and two for the process of delivery, termed “focus modules” (see descriptions in Table 1). The program schedule includes a minimum of 25 home visits (approximately 60–90 min), primarily by the same right@home nurse. Three visits are scheduled antenatally, with the remainder during the first 2 years postbirth. The actual number of antenatal home visits that a woman receives is determined by gestation and may vary. Postnatal visits are scheduled to occur within 1 week of birth; at least weekly until 6 weeks; fortnightly until 12 weeks; 3-weekly to 6 months; 6-weekly to 12 months; and bi-monthly until 2 years. Nurses incorporate the well-child checks that are delivered via usual care (described below) into the home visits, ensuring right@home builds on the universal platform. In preparation for discharge from right@home, families are assisted to re-enter the usual care service.

Table 1 describes the evidence-based strategies that contributed to the focus modules and were aligned with the primary outcome domains. While some of the content (e.g., sleep, safety, and nutrition) and supports were sometimes provided in the usual CFH service, right@home provided them systematically. In right@home, although the focus modules were designed for implementation at specific developmental points, nurses still structured each visit flexibly to best address each mother’s needs, skills, strengths, and capacity. They were guided by a strengths-based approach and joint goal setting, an integral part of the Family Partnership Training and aligned with our literature review findings. The nurse supported and enabled the mother and the family to: enhance their coping and problem solving skills and ability to mobilize resources; foster positive parenting skills; support the family to establish supportive relationships in their community; mentor maternal–infant bonding and attachment; and provide proactive primary health care and anticipatory health education, including but not limited to evidence-based information regarding immunization, sudden infant death syndrome risk reduction, infant nutrition, and child safety. Nurses and social care practitioners also helped parents access early childhood health services, volunteer home visiting services and family support services; hold group activities specifically for program families; and link women into community activities, as needed.

The standard CFH service (usual care) provides well-child checks delivered by community-based nurses and is available to all families from birth until 5 years at no out-of-pocket cost. In the first 2 years, all families are offered six (Tasmania) or nine checks (Victoria). The first visit occurs in families’ homes with successive visits at a local center. Nurses also provide a needs-based enhanced service, which involves additional home or center visits; eligibility is decided by the local area’s CFH service. The key differences between the right@home program and the usual care were: home visiting commencing antenatally; continuity of care by the same nurse throughout the 2.5 year program; care by nurses with additional training in the program model; postnatal home visiting program to the child’s second birthday including: the MECSH structured program, well-child checks, proactive (rather than needs-based) preventive and anticipatory primary health care and health education, and standardized focus modules aligned with primary outcomes; dedicated social care practitioner in the team; and group activities specifically tailored for the right@home families.

Program effectiveness
Methods
The right@home program was tested via RCT, examining the effectiveness of the NHV program (the intervention) on the three outcome domains at
child age 2 years, compared with the existing universal CFH service (control/usual care). Researchers recruited pregnant women from the public maternity hospitals in four local government areas (LGAs) in Victoria and three regions in Tasmania. Trial sites were selected for their high prevalence of families experiencing socioeconomic adversity, a mix of metropolitan and regional areas, and interest from the local CFH services in participating.

Women who attended the antenatal clinics from April 30, 2013 to August 29, 2014 with: (1) expected due dates before October 1, 2014, (2) <37 weeks gestation, (3) sufficient English to verbally answer questions, (4) ≥2 of 10 risk factors identified by a paper-based screening survey, and (5) home addresses within travel boundaries specified by the participating area were eligible to participate. Women were excluded if they: (1) were enrolled in the existing Tasmanian CU@Home program (a state-based NHV program for 15- to 19-years-olds); (2) did not comprehend the recruitment invitation (e.g., had an intellectual disability such that they were unable to consent to participation, or had insufficient English to complete face-to-face assessments); (3) had no mechanism for contact (landline or mobile telephone, or email address); or (4) experienced a critical event that excluded their participation (e.g., termination of pregnancy, still birth, participant or child death). Each participant provided final signed, informed consent before completing the home-based baseline interview. A total of 722 women enrolled in the trial: 363 women randomized to the intervention and 359 to the control (Fig. 2 shows the participant flow).

Table 2 describes the antenatal characteristics of the cohort; the socio-demographic profile reflects high adversity. Trained researchers conducted follow-up assessments in participants' homes at child age 2 years.

**Effectiveness findings**

Beneficial effects for the program group were evident for 6 of the 13 primary outcomes across the three main outcome domains of parent care, responsiveness, and the home learning environment, with no evidence of effects favoring the control group (Fig. 3). Compared with the control group, the program group reported safer family homes (effect size (ES) = 0.16, \( P = 0.016 \)), more regular child bedtime (odds ratio = 1.68, \( P = 0.002 \)), and a more
Table 2. Participant demographic characteristics

| Maternal characteristics                                      | Total (N = 722) | n    | %   |
|----------------------------------------------------------------|-----------------|------|-----|
| Age (years; months), m(SD)                                     | 722             | 27.6 | 6.2 |
| Did not complete high school                                   | 163             | 25.1 |
| Not currently employed                                          | 478             | 66.2 |
| Single (never married)/not living with partner                 | 195             | 27.0 |
| Poorer health                                                   | 400             | 56.3 |
| Felt threatened in own home                                     | 122             | 17.0 |
| Experienced domestic violence in the past year                 | 85              | 11.9 |
| Had a drinking problem in the past year                        | 29              | 4.0  |
| Ever had a drug problem                                         | 111             | 15.5 |
| Currently smokes (assessed at screening)                       | 237             | 32.8 |
| Government income support                                       | 309             | 42.8 |
| Current housing problems (utilities, mold, lead and overcrowding) | 120             | 17.4 |
| Currently being threatened with eviction                       | 18              | 2.6  |

varied home environment including opportunities for social interaction with adults (ES = 0.18, P = 0.016). Program mothers also engaged in warmer (ES = 0.21, P = 0.010) and more agreeable parenting practices (i.e., showing less hostility) (ES = –0.25, P < 0.001) with their child, and more facilitation of their child’s learning (ES = 0.22, P = 0.001) than control mothers.

Quality and implementation evaluation

The extensive and partnership-based processes of program development highlighted that the effectiveness of NHV programs is a product of quality in what the program delivers (known as structural or implementation fidelity) and how it is delivered (known as dynamic, intervention, or process fidelity).\textsuperscript{51} Increasingly home visiting programs, including right@home, are recognizing and instigating measures of both fidelity forms. Sustaining and embedding quality program provision, where the aim is to ensure that the program can be effectively implemented postresearch and at-scale, requires ongoing partnership within the implementation team of stakeholders, practice teams, and program implementation specialists to support the quality of the delivery system,\textsuperscript{62} and prevent at-scale implementation falling prey to the two deadly Ds’: drift and dilution. Drift is defined by Aarons as “a misapplication or mistaken application of the model, often involving either technical error, abandonment of core and requisite components, or introduction of counterproductive elements.”\textsuperscript{63} Dilution is the failure to deliver the intensity or duration of program as intended. The implementation team worked throughout the trial to establish the quality monitoring methods described below and continues in the limited post-trial implementation (from 2017) in eight Victorian LGAs to ensure ongoing program quality.

Methods

The quality of the right@home program, including dose, client retention, delivery of program content, and implementation processes, was systematically monitored by the MECSH Support Service through quarterly review of program delivery and feedback on performance to the participating sites. Quality monitoring included assessment of training completion, supervision processes, dose, retention rates, content monitoring, family rating of the service, and provision of standardized feedback to each participating site. The program has an aspirational retention, dose, and content performance indicator that 100% of families should receive 100% of visits and scheduled content. Overall program fidelity was deemed to be satisfied if more than 75% of families received more than 75% of the visits, including at least one antenatal visit.

Structural (implementation) quality monitoring. An online checklist was developed to capture the date, duration, and content of each visit undertaken by the nurse or social worker, recording content delivered from a choice of 48 items antenatally and 56 items postnatally. The database and its entry portal were designed for sustainability, located on the practitioner’s mobile device (tablet) with simple touch entry. Practitioners were advised to complete the checklist immediately after each visit, for example, when returning to the car or walking to the next visit, so that it became habitual practice. Training completion is monitored by the training providers and each participating site provides qualitative evidence of practitioner supervision and case review. These data are extracted quarterly from each source and collated into a report which is fed back to the
sites detailing retention, dose, visit duration and content, training, supervision, and case review.

In addition, as a program embedded in the usual CFH service system, the availability and effectiveness of referral pathways both into the program and for accessing additional support for families (such as specialist mental health or child development services) is monitored through qualitative narrative provided by participating sites. A spreadsheet for calculating and monitoring each nurse’s caseload was jointly developed between TReSI and the participating sites, used for quarterly monitoring to ensure that the maximum numbers of families had access to the service, and were recruited at an appropriate rate to ensure delivery with quality.

**Dynamic (intervention or process) quality monitoring.** Dynamic quality was monitored using five processes:

1. At child ages 3, 6, 12, 26, 52, and 104 weeks, the family completed the Session Rating Scale, a brief working alliance measure, in conjunction with the nurse. This was conducted in the context of a conversation between the family and the nurse where the nurse seeks honest family feedback about how well the family felt understood, the degree to which the visit focused on the issues the family wanted to work on, whether the visit approach made sense and worked for the family, and whether the visit was right for the family overall.

2. At child ages 6, 52, and 104 weeks, families in both the program and control groups completed researcher administered surveys asking their satisfaction with the service (Parent Satisfaction Questionnaire (PSQ)) in the domains of communication, interpersonal manner, time spent, accessibility, and general satisfaction; and whether the program was enabling them to better understand and cope with the health and needs of themselves and their child, to keep themselves healthy, and help themselves (Parent Enablement Index (PEI)).

3. At two points during the first 3 years of right@home implementation, midway and at the end of the trial, all nurses and social workers participated in focus groups to discuss...
the strengths and challenges of the program. These groups were recorded and transcribed and analyzed thematically.

4. At the end of the program, each family is given the opportunity to provide written or telephone feedback about their experience of the program and if, and how, the program impacted on their family and children. For families who participated in the right@home trial, the interviews were scheduled approximately 6–9 months after women completed the program to allow them time to reflect on their experience of the program and an opportunity to implement program content. Interview questions sought to explore women’s general experiences of the right@home program including any changes that occurred, on topics including: their general experiences of parenting; what about the program they found useful to their parenting; their perceptions about whether the program was helpful or impacted on their parenting; how their help-seeking behavior and knowledge about supports changed; and how the program changed how they respond to their children.

Theory of change monitoring. The quantitative structural quality data, together with dynamic data, are collated to monitor the program theory of change; that is, to ensure that the program is working for families in the way it is intended. This monitoring includes:

1. Exploratory factor analysis (principal components analysis with varimax rotation) of program activities the nurses noted as undertaken in each visit using the checklists to determine concordance between delivered content and program aims as articulated in the right@home program logic (Fig. 1).

2. Thematic analysis of families' perceptions of the program from their written or telephone feedback.

Key quality and implementation findings

Structural quality. Training, caseload, referral, and supervision monitoring revealed that all processes were implemented as expected. In two sites, there was management and supervisor turnover which resulted in brief periods (1–2 months) of disruption to supervision and case review. These same two sites also experienced unavoidable nurse home visitor turnover and periods of remaining staff having to manage caseloads higher than mandated: this did not impact on program delivery quality, but was a source of short-term stress within the NHV team. Referral pathways were well established before the introduction of the program and continued to operate as expected to support program families.

Take up of and retention in the program was high in the trial with 97.0% of families commencing the program (353 of 363 women randomized to the intervention group) and 304 (86.4%) completing the program at child age 2 years. These measures have remained high in post-trial implementation with 95.5% of families offered the program commencing (275 of 288) and 243 (88.4%) retained in the program at child age 12 months (post-trial implementation has not yet reached the stage of full program completion). Dose fidelity in both the trial and post-trial implementation has been consistent with program expectations, except for antenatal provision which was lower than expected in the trial due to recruitment of some families into the trial too late in pregnancy to allow completion of the required three antenatal visits: post-trial early antenatal enrolment has been impacted by some lack of adequate notification pathways from midwifery/obstetric services to NHV services. Figure 4 presents the average number of visits in each scheduled section of the program and the graphic presentation as provided in feedback to sites for both the overall trial implementation and post-trial implementation.

Dynamic quality. Families in the trial rated their relationship with the right@home nurse very highly using the Session Rating Scale, scoring an average of 39.5 out of 40. Families’ satisfaction with the service they received (PSQ) and its impact on enablement (PEI) were rated more highly by the trial program families than usual care group (PSQ program group mean 44.4 (SD 4.1) out of possible 50, control group 37.9 (SD 7.2) P < 0.001; PEI program group mean 4.5 (SD 4.1) out of possible 12, control group 2.3 (SD 3.22) P < 0.001). Post-trial families have continued to meet fidelity criteria with 100% of families scoring their satisfaction in the expected range indicating high satisfaction (>30), and 92.9% of
families scoring their enablement in the high range (>4).

Ten focus groups with right@home clinicians and their managers were conducted during the trial. Clinicians reported a positive shift in their experience of service delivery, which they attributed to the program’s blend of structure and flexibility to work effectively with families, and partnership working both with families and the multidisciplinary team, as described by one nurse: “It’s been quite a surprise how enormously it has changed my practice. I don’t know that I can go back to working in another way.” Another noted “it was obvious it was doing good, it was obvious that some families that normally wouldn’t see that level of progress or ability developed because we were able to use their strength and support them.” Focus groups also revealed concerns about the adequacy and timing of training and mixed experiences of supervision and case review associated with staffing disruption.

**Theory of change.** Factor analysis of content delivered in each visit during the trial demonstrated that the program was being delivered in accordance with the expected content, and content was delivered in clusters that aligned with the program aims, with the components of antenatal and postnatal activity explaining a total of 50.3% and 47.8% of variance, respectively (Table 3). Qualitatively, the families recognized the many challenges they faced in their parenting, noting particularly histories of difficult relationships within their families, mental health issues, and lack of confidence in their parenting capacity. They appreciated the change-making potential of the long-term relationship between the nurse and family. For families, the nurses are like a friend with a degree; the relationship between the nurse and family supported families to participate in local parenting groups, and with primary and specialist services. Parents “found that having more knowledge about the services available to them and the people who would be delivering the services beneficial” and were more likely to engage.

Parents felt they built skills and confidence from being on the program, both in the transition to parenting and throughout, as stated by one mother: “Learning all those basic things because you can read as much as you like, but once you get hands
Table 3. Concordance between right@home program aims, visit activity components, and family perceptions

| right@home program aim                                           | Antenatal activity component                  | Postnatal activity component                | Family perceptions from interviews               |
|-----------------------------------------------------------------|------------------------------------------------|---------------------------------------------|------------------------------------------------|
| Positive transition to parenting                                | Being prepared and healthy (10.0)              | Maternal mental health (10.4)               | Putting knowledge into practice and getting set up |
| Mother, child, and family health, development, and wellbeing    | Maternal and family wellbeing (8.7)            | Maternal physical and mental health (7.5)   | Maternal physical and mental health              |
| Maternal–infant bonding and attachment                         | Infant care and interaction (12.9)            | Being responsive and child focused          |                                                |
| Positive parenting skills                                       | Being prepared and healthy (10.0)              | Child development, safety, and maternal wellbeing (7.2) | Built skills and confidence                      |
| Mothers to be future oriented and aspirational for themselves, their child, and family | Aspirations and planning (7.7)                  |                                                |                                                |
| Mother and family enhance coping and problem-solving skills, and ability to mobilize resources | Planning and goal setting (6.8)                | Aspirations and planning (7.7)              | Being aspirational and improved self-efficacy    |
| Supportive relationships in their family and community          | Mother and family expectations and relationships (8.9) | Family relationships and environment (6.9) Family worries (5.6) | Enabled to participate in local groups and services |

on it’s a completely different thing.” Parents also felt supported to positively respond to their child, for example, as one mother said: “Instead of saying, ‘He’s looking at me. Here’s a toy’ . . . I was able to say, ‘he’s exploring the world’ or, ‘he’s coming back in, he really needs connection with me.’” The attention of the program on the child’s development, and promotion of goals and aspirations for both the child and parents had positive outcomes, as one mother noted:

right@home offers me very mental like support, social support and personal support. You focus on me in a person centered way and when you are with me it is about me, my kids, my family and what I want . . . I thought I was broken and you helped me to fight and get rid of this black cloud inside by head. I know it’s big words but I had noticed and I’d seen it . . . I was in a dark place and you’ve helped me realize I’m not a burden and I am more and can do more for my family.

Challenges and enablers to implementation.

The right@home quality processes comprehensively monitor both structural and dynamic quality, with quarterly analysis and feedback processes. While this monitoring depth and intensity has ensured an exceptionally high-quality program, it required considerable investment in delivery systems. Critical to the success of right@home, both during the trial and post-trial, has been the engagement of the implementation team, including the state and local service stakeholders, practitioners, and the technical support team. Maintaining the team as needed for a long term view of implementation provided some challenges due to staff and leadership turnover. Also challenging was working with the services to develop an understanding of quality implementation of program processes as being about ensuring the best outcomes for the participating families and sustainability, rather than as a short-term requirement of research.

Quality implementation was enabled by the clear articulation of the right@home program logic and the core and adaptation processes that ensured that the program had both fidelity to the evidence and a good fit to context. The high levels of program uptake, retention and dose, and the congruence...
between the program as expected and as delivered were enabled by service and practitioner commitment to fidelity, which was in turn supported by the detailed review and feedback provided by the MECSH Support Service to sites quarterly. In a recent review by Casillas et al.,\textsuperscript{64} higher program outcome effects were associated with independent quality monitoring that provide detailed and immediate feedback to practitioners and services.

**Implications for replication, adaptation, and scale**

Home visiting service delivery models must be flexible enough to cater for the variations within families, while maintaining a constant core of evidence-based practice. Three features appear to be especially important:

- **threshold factors** that facilitate the engagement of families experiencing adversity (e.g., relationship-based, partnership-based, and capacity-building);
- **partnerships with parents to identify family goals and identify strategies** required to achieve those goals; and
- **evidence-based strategies** shown to improve the outcomes targeted.\textsuperscript{33,35,40}

While the processes by which the outcomes of NHV programs are achieved—that is how home visiting programs work and what makes them successful—are largely unknown in the literature, our findings indicate that the factors that facilitate the engagement of families experiencing adversity (e.g., relationship-based, partnership-based, and capacity-building approaches) and the parent-professional partnerships that occur within home visiting programs are likely to be extremely important to their success.\textsuperscript{65–67} These findings are reinforced by lessons from low- and middle-income countries where despite more limited resources, the attention to detail in building (and maintaining) workforce capacity and support, engaging with families, using evidence-based strategies, and utilizing existing services is a recurrent theme associated with any implementation success.\textsuperscript{68–70} Although there is a well-recognized tension between fidelity and flexibility when implementing any program,\textsuperscript{71} it is important that those who seek to develop new home visiting programs—or adapt existing ones—consider how fidelity and flexibility can be achieved.\textsuperscript{72} This is especially important because families who are experiencing adversity are more likely to respond to programs that provide opportunities for relationships that are not driven by a rigid focus, but allow for the development of a trusting, reciprocal relationship with professions that facilitates joint decision-making, and strengths-based approaches. The importance of focusing on the right target group and their needs is highlighted by Segal and colleagues: "If there is little understanding about how to work with a particular population . . . then it is unlikely that a successful home visiting program can be developed and delivered (p. 88)."\textsuperscript{54}

The right@home NHV program was designed with (1) a strong focus on the parent and home environment outcomes known to impact child learning and development outcomes that are measurable in the shorter term,\textsuperscript{23} (2) a concurrent focus on evidence based strategies likely to deliver on the outcomes, (3) attention to training and support of the nurses and social care practitioners to enable supportive relationships, (4) goals for translation considered and planned from the outset, (5) the program embedded within the existing universal systems, and (6) attention to implementation and fidelity. The program was therefore implemented with quality. Families in the right@home trial program group were retained in the program for the expected duration and received the program dose as scheduled in terms of the total number of visits overall and in each program stage. Content was consistent with the program aims. The retention of families in the program and the proportion of schedule dose received were higher than achieved in comparable home visiting programs. The families also rated the relationship with their nurse provider consistently high. This quality was particularly notable as the right@home program was delivered through usual CFH services, rather than using nurses or systems especially established for the research. The structure and flexibility of the program and alignment with families’ goals and capacity, together with the timeliness and depth of the quality monitoring processes, may have contributed to program quality that was superior to most previously evaluated home visiting programs.

The potential benefits of home visiting programs are obvious, especially considering that the families...
experiencing the most adversity are often the least able to access the resources provided by CFH and support services. The international enthusiasm for home visiting programs needs to be tempered with the fact that even the most successful home visiting programs have moderate effects. Future research should focus on fidelity and implementation of existing effective programs with implementation and improvement science having a prominent role in further replication studies. The “how” of NHV including nurse/practitioner training and support, parent engagement, and system embedding may be the most essential elements of success. The threshold factors related to engagement of families experiencing adversity deserve specific attention in terms of adequate training, ongoing nurse support, and continuing measurement, particularly systematic monitoring of both what is delivered to families (structural quality) and the way it is delivered (dynamic quality). For families living in adversity, it may be that the mutual benefit of both continuity and complementarity of services will be necessary to promote human capital. To that end, there is sufficient evidence for policymakers to deliver on the potential cumulative (and mutual) benefit of a number of interventions in early childhood (e.g., antenatal care, early childhood education and care, parenting programs) together with NHV, as the “silver bullet” approach for families experiencing adversity is neither realistic nor sustainable on its own in the complex social environment of the 21st century.

Conclusion

A NHV program, right@home is effective in improving aspects of parent care, responsivity, and the home learning environment over and above the existing universal CFH services. The detail of implementation makes a crucial contribution to the evidence of how programs can be effectively delivered within existing universal CFH services to reduce the impact of social and environmental factors predisposing children to inequitable outcomes. The excellent rates of fidelity and retention suggest that replicability is possible at scale, with implications for the development of early childhood policy and strategy in Australia and other countries with universal well-child health care provision.

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Author contributions

S.G. led the research evaluation of right@home, contributed to the conception of the design and paper and interpretation of data, was involved in writing and editing of drafts, and approved the final manuscript. A.P. managed the research evaluation for right@home, contributed to the conception of the design and paper and interpretation of data, was involved in writing and editing of drafts, and approved the final manuscript. L.K. led the implementation of right@home, contributed to the conception of the design and paper and interpretation of data, was involved in writing and editing of drafts, and approved the final manuscript.

Competing interests

The authors declare no competing interests.

References

1. Duncan, G. & K. Magnuson. 2013. The importance of poverty early in childhood. Policy Quarterly 9: 12–17.
2. Pavalko, E.K. & J. Caputo. 2013. Social inequality and health across the life course. Am. Behav. Sci. 57: 1040–1056.
3. Hart, J.T. 1971. The inverse care law. Lancet 297: 405–412.
4. Fram, M.S. 2003. Managing to Parent: Social Support, Social Capital, and Parenting Practices among Welfare-Participating Mothers with Young Children. Discussion Paper University of Wisconsin–Madison, Institute for Research on Poverty.
5. Ghate, D. & N. Hazel. 2002. Parenting in Poor Environments: Stress, Support and Coping. Jessica Kingsley Publishers.
6. Offord, D.R. 1987. Prevention of behavioral and emotional disorders in children. J. Child Psychol. Psychiatry Allied Discipl. 28: 9–19.
7. Watson, J., A. White, S. Taplin & L. Huntsman. 2005. Prevention and early intervention literature review. New South Wales Department of Community Services, Sydney.
8. Brown, S.J., J.S. Yelland, G.A. Sutherland, et al. 2011. Stressful life events, social health issues and low birthweight in an Australian population-based birth cohort: challenges and opportunities in antenatal care. BMC Public Health 11: 196.
9. Ou, L., J. Chen, P. Garrett & K. Hillman. 2011. Ethnic and Indigenous access to early childhood healthcare services in Australia: parents’ perceived unmet needs and related barriers. Aust. N. Z. J. Public Health 35: 30–37.
10. Smith, D., N. Edwards, C. Varcoe, et al. 2006. Bringing safety and responsiveness into the forefront of care for pregnant and parenting Aboriginal people. Adv. Nurs. Sci. 29: e27–e44.
11. Teitler, J.O., N.E. Reichman, L. Nepomnysyach & M. Martinson. 2007. A cross-national comparison of racial and ethnic disparities in low birth weight in the United States and England. Pediatrics 120: e1182–e1189.
12. Levesque, J.F., M.F. Harris & G. Russell. 2013. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. Int. J. Equity Health 12: 18.
13. Boller, K., D.A. Strong & D. Daro. 2010. Home visiting: looking back and moving forward. Zero to Three 30: 4–9.
14. Howard, K.S. & J. Brooks-Gunn. 2009. The role of home-visiting programs in preventing child abuse and neglect. Future Child. 19: 119–146.
15. Kahn, J. & K.A. Moore. 2010. What works for home visiting programs: lessons from experimental evaluations of programs and interventions. Child Trends Fact Sheet, Washington.
16. Landy, S. & R. Menna. 2006. Early Intervention with Multi-Risk Families: An Integrative Approach. Baltimore, MD: Paul H. Brookes.
17. Sweet, M.A. & M.I. Appelbaum. 2004. Is home visiting an effective strategy? A meta-analytic review of home visiting programs with families with young children. Child Dev. 75: 1435–1456.
18. Gomby, D.S. 2005. Home visitation in 2005: outcomes for children and parents. http://legis.wisconsin.gov/lc committees/study/2008/SFAM08/files/GombyHVoutcomes 2005.pdf.
19. Bennett, C., G.M. Macdonald, J. Dennis, et al. 2007. Home-based support for disadvantaged adults mothers. Cochrane Database Syst. Rev.: CD003759.
20. Leurer, M.D. 2011. Perceived barriers to program participation experienced by disadvantaged families. Int. J. Health Promot. Educ. 49: 53–59.
21. Carbone, S., A. Fraser, R. Ramburuth & L. Nelms. 2004. Breaking cycles, building futures. Promoting inclusion of vulnerable families in antenatal and universal early childhood services. Victorian Government Department of Human Services, Melbourne.
22. Koenig, K. 2007. Pilot study of low-income parents’ perspectives of managing asthma in high-risk infants and toddlers. Pediatr. Nurs. 33: 223.
23. Moore, T.G., M. Keyes & S. Sanjeevan. 2011. Research evidence to support a revised service delivery model for the Victorian Enhanced Maternal and Child Health Service: a literature review. Prepared for the Department of Education and Early Childhood Development. Centre for Community Child Health, Murdoch Childrens Research Institute, The Royal Children’s Hospital, Parkville, Victoria.
24. Olds, D.L., C.R.J. Henderson, R. Cole, et al. 1998. Long-term effects of nurse home visitation on children’s criminal and antisocial behaviour. J. Am. Med. Assoc. 280: 1238–1244.
25. Olds, D.L., J. Eckenrode, C.R.J. Henderson, et al. 1997. Long-term effects of home visitation on maternal life course and...
child abuse and neglect: fifteen-year follow-up of a randomized trial. *JAMA* **278**: 637–643.

26. Olds, D.L., H. Kitzman, R. Cole, *et al.* 2004. Effects of nurse home-visiting on maternal life course and child development: age 6 follow-up results of a randomized trial. *Pediatrics* **114**: 1550–1559.

27. Caldera, D., L. Burrell, K. Rodriguez, *et al.* 2007. Impact of a statewide home visiting program on parenting and on child health and development. *Child Abuse Negl.* **31**: 829–852.

28. DuMont, K., S. Mitchell-Herzfeld, R. Greene, *et al.* 2006. Healthy Families New York (HFNY) randomized trial: impacts on parenting after the first two years. New York State Office of Children & Family Services.

29. Love, J.M., E.E. Kisker, C. Ross, *et al.* 2005. The effectiveness of early head start for 3-year-old children and their parents: lessons for policy and programs. *Dev. Psychol.* **41**: 885–901.

30. Ogden, C.L., R.J. Kuczmarski, K.M. Flegal, *et al.* 2002. Centers for Disease Control and Prevention 2000 growth charts for the United States: improvements to the 1977 National Center for Health Statistics version. *Pediatrics* **109**: 45–60.

31. Paradise, J.L., H.E. Rockette, D.K. Colborn, *et al.* 1997. Otitis media in 2253 Pittsburgh-area infants: prevalence and risk factors during the first two years of life. *Pediatrics* **99**: 318–333.

32. Robling, M., M.-J. Bekkers, K. Bell, *et al.* 2015. Effectiveness of a nurse-led intensive home-visitation programme for first-time teenage mothers (Building Blocks): a pragmatic randomised controlled trial. *Lancet* **387**: 146–155.

33. McDonald, M., T. Moore & S. Goldfeld. 2012. Sustained nurse home visiting for families and children: a review of effective programs. Prepared for Australian Research Alliance for Children and Youth. The Royal Children’s Hospital Centre for Community Child Health, Murdoch Childrens Research Institutes, Parkville, Victoria.

34. Mejdoubi, J., S.C. van den Heijnk, F.J. van Leerdam, *et al.* 2013. Effect of nurse home visits vs. usual care on reducing intimate partner violence in young high-risk pregnant women: a randomized controlled trial. *PLoS One* **8**: e78185.

35. McDonald, M., T. Moore & S. Goldfeld. 2012. Sustained nurse home visiting for families and children: a review of effective processes and strategies. Prepared for Australian Research Alliance for Children and Youth. The Royal Children’s Hospital Centre for Community Child Health, Murdoch Childrens Research Institute, Parkville, Victoria.

36. Kemp, L., E. Harris, C. McMahon, *et al.* 2008. Miller Early Childhood Sustained Home-visiting (MECSH) trial: design, method and sample description. *BMJ Public Health* **4**: 424.

37. Kemp, L., E. Harris, C. McMahon, *et al.* 2011. Child and family outcomes of a long-term nurse home visitation programme: a randomised controlled trial. *Arch. Dis. Child.* **96**: 533–540.

38. Marmot, M., J. Allen, P. Goldblatt, *et al.* 2010. *Fair Society, Healthy Lives: The Marmot Review*. I think this is available here: http://www.instituteofhealthequity.org/resources-reports/fair-society-healthy-lives-the-marmot-review.

39. Paulsell, D., P. Del Grosso & L. Supplee. 2014. Supporting replication and scale-up of evidence-based home visiting programs: assessing the implementation knowledge base. *Am. J. Public Health* **104**: 1624–1632.

40. Moore, T., M. McDonald & S. Sanjeevan. 2012. Evidence-based service modules for a sustained nurse home visiting program: a literature review. Prepared for the Australian Research Alliance for Children and Youth. Centre for Community Child Health (CCCH) & Murdoch Children’s Research institute, Parkville, Victoria.

41. Matthey, S. 2009. Women’s perceptions of the causes of their postnatal distress: development of the reasons for postnatal distress checklist. *Depress. Anxiety* **26**: 938–948.

42. Hiscock, H., J. Bayer, L. Gold, *et al.* 2007. Improving infant sleep and maternal mental health: a cluster randomised trial. *Arch. Dis. Child.* **92**: 952–958.

43. Hiscock, H., J.K. Bayer, A. Hampton, *et al.* 2008. Long-term mother and child mental health effects of a population-based infant sleep intervention: cluster-randomized, controlled trial. *Pediatrics* **122**: e621–e627.

44. Australian Government Department of Health. 2009. Get up & grow: healthy eating and physical activity for early childhood. Commonwealth of Australia.

45. Kelly, J.F., T.G. Zuckerman, D. Sandoval & K. Buehlman. 2008. Promoting first relationships: a program for service providers to help parents and other caregivers nurture young children’s social and emotional development. NCAST-AVENUU Publications, Seattle, WA.

46. Anderson, T. 1997. *Learning to Communicate: A Guide to Infant Communication Development*. Liverpool: South West Sydney Area Health Service.

47. Parenting Research Centre. The early home learning study (EHLs) and smalltalk program and materials. Accessed May 11, 2016. http://www.smalltalk.net.au/.

48. Duncan, B., S. Miller, J. Sparks, *et al.* 2003. The Session Rating Scale: preliminary psychometric properties of a “working” alliance measure. *J. Brief Ther.* **3**: 3–12.

49. Marshall, G.N. & R.D. Hays. 1994. The Patient Satisfaction Questionnaire Short-Form (PSQ-18). Santa Monica, CA: RAND.

50. Howie, J.G., D.J. Heaney, M. Maxwell & J.J. Walker. 1998. A comparison of a Patient Enablement Instrument (PEI) against two established satisfaction scales as an outcome measure of primary care consultations. *Fam Pract.* **15**: 165–171.

51. Goldfeld, S., A. Price, H. Bryson, *et al.* 2017. right@home: a randomised controlled trial of sustained nurse home visiting from pregnancy to child age 2 years, versus usual care, to improve parent care, parent responsibility and the home learning environment at 2 years. *Br. Med. J. Open* **7**: e013307.

52. Caldwell, B. & R. Bradley. 2003. *Home Observation for Measurement of the Environment: Administration Manual*. Tempe, AZ: Arizona State University, Family & Human Dynamics Research Institute.

53. Aarons, G.A., D.L. Fettes, D.H. Sommefeld & L.A. Palinkas. 2012. Mixed methods for implementation research application to evidence-based practice implementation and staff turnover in community-based organizations providing child welfare services. *Child Maltreat.* **17**: 67–79.
54. Segal, L., R.S. Opie & K. Dalziel. 2012. Theory! The missing link in understanding the performance of neonate/infant home-visiting programs to prevent child maltreatment: a systematic review. *Milbank Q.* 90: 47–106.

55. Kemp, L. 2016. Adaptation and fidelity: a recipe analogy for achieving both in population scale implementation. *Prev. Sci.* 17: 429–438.

56. Kiernan, K.E. & F.K. Mensah. 2011. Poverty, family resources and children’s early educational attainment: the mediating role of parenting. *Br. Educ. Res. J.* 37: 317–336.

57. Farah, M.J., L. Betancourt, D.M. Shera, et al. 2008. Environmental stimulation, parental nurturance and cognitive development in humans. *Dev. Sci.* 11: 793–801.

58. Levickis, P., S. Reilly, L. Girolametto, et al. 2014. Maternal behaviors that promote early language acquisition in slow-to-talk toddlers: prospective community-based study. *J. Dev. Behav. Pediatr.* 35: 274–281.

59. Sylva, K., et al. 2004. The effective provision of pre-school education (EPPE) project technical paper 12: The final report-effective pre-school education. Institute of Education, University of London/Department for Education and Skills, 2004.

60. The Centre for Parent and Child Support. 2017. Family partnership model. Accessed October 23, 2017. http://www.cpcs.org.uk/index.php?page=about-family-partnership-model.

61. Daro, D., K. Boller & B. Hart. 2014. Implementation fidelity in early childhood home visiting: successes meeting staffing standards, challenges hitting dosage and duration targets. Mathematica Policy Research, Chaplain Hall, The University of Chicago.

62. Meyers, D.C., J.A. Durlak & A. Wandersman. 2012. The quality implementation framework: a synthesis of critical steps in the implementation process. *Am. J. Community Psychol.* 50: 462–480.

63. Aarons, G.A., A.E. Green, L.A. Palinkas, et al. 2012. Dynamic adaptation process to implement an evidence-based child maltreatment intervention. *Implement. Sci.* 7: 32.

64. Casillas, K.L., A. Fauchier, B.T. Derkash & E.F. Garrido. 2016. Implementation of evidence-based home visiting programs aimed at reducing child maltreatment: a meta-analytic review. *Child Abuse Negl.* 53: 64–80.

65. Heinicke, C.M., M. Goorsky, S. Moscov, et al. 2000. Relationship-based intervention with at-risk mothers: factors affecting variations in outcome. *Infant Ment. Health J.* 21: 133–155.

66. Kardamanidis, K., L. Kemp & V. Schmied. 2009. Uncovering psychosocial needs: perspectives of Australian child and family health nurses in a sustained home visiting trial. *Contemp. Nurse* 33: 50–58.

67. Kemp, L., E. Harris, C. McMahon, et al. 2013. Benefits of psychosocial intervention and continuity of care by child and family health nurses in the pre- and postnatal period: process evaluation. *J. Adv. Nurs.* 69: 1850–1861.

68. Tomlinson, M., X. Hunt & M.J. Rotheram-Borus. 2018. Diffusing and scaling evidence-based interventions: eight lessons for early child development from the implementation of perinatal home visiting in South Africa. *Ann. N.Y. Acad. Sci.* 1419: 218–229.

69. Nores, M., A. Figueras-Daniel, M.-A. Lopez & R. Bernal. Implementing aeiOTU: quality improvement alongside an efficacy study—learning while growing. *Ann. N.Y. Acad. Sci.* 1419: 201–217.

70. Yusafzai, A.K., M.A. Rasheed & S. Siyal. 2018. Integration of parenting and nutrition interventions in a community health program in Pakistan: an implementation evaluation. *Ann. N.Y. Acad. Sci.* 1419: 160–178.

71. Herschell, A.D. 2010. Fidelity in the field: developing infrastructure and fine-tuning measurement. *Clin. Psychol.* 17: 253–257.

72. Baker-Henningham, H. 2018. The Irie Classroom Toolbox: developing a violence prevention, preschool teacher training program using evidence, theory, and practice. *Ann. N.Y. Acad. Sci.* 1419: 179–200.

73. Filene, J.H., J.W. Kaminski, L.A. Valle & P. Cachat. 2013. Components associated with home visiting program outcomes: a meta-analysis. *J. Pediatr.* 132(Suppl. 2): S100–S109.

74. Heckman, J.J. & S. Mosso. 2014. The economics of human development and social mobility. *Annu. Rev. Econ.* 6: 689–733.