"Putting Meat on the Bones": Understanding the Implementation of a Community-Based Early Intervention and Prevention Programme—Contextual, Person, and Programme Influences

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Abstract

The adoption and effective delivery of evidence-based interventions within "real-world" community-based, primary health care service settings are of crucial importance. In this paper, we explore the successes and challenges of implementing a new complex, group-based, early parenting intervention called the Parent and Infant (PIN) programme. This study involved a systematic analysis of the processes and factors that influence the implementation of the PIN programme; the analysis was guided and informed by the Implementation Outcome Framework and the Consolidated Framework for Implementation Research. A documentary review, alongside a series of one-to-one interviews and small group discussions with a range of stakeholders ($n = 44$), and 7 focus groups ($n = 24$) were used as data sources. Factors that promoted programme adoption, acceptability, and implementation feasibility included programme characteristics and stakeholder attitudes, as well as organisational and systems factors (e.g. leadership and collaboration). Key challenges to implementation success included engagement and adoption barriers. This research provides a useful and important example of real-world, theory-driven implementation research which helped to identify interrelated processes, factors, and contexts which shape and influence the implementation of early intervention and prevention programmes, removed for blind review.

Keywords Evaluation · Implementation science · Mechanisms of impact · Implementation outcomes · Early intervention and prevention · Early parenting intervention

Introduction

The delivery and effective implementation of evidence-based programmes is vitally important for ensuring both a positive impact on health and wellbeing outcomes and an optimal return on expenditure on primary health care services (Williams et al. 2020). Childhood development programmes, which target the earliest years (0–3 years) and which focus on

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promoting nurturing parental care, are increasingly a feature of global policies and initiatives aimed at tackling intergenerational disadvantage and inequality (Britto et al. 2017). Indeed, considerable evidence suggests that high-quality parent-focused prevention and early intervention programmes can help to promote positive parenting and child development outcomes (Lindsay 2019). However, there are significant challenges to embedding programmes of this nature in primary care and community-based early years' service settings (Metz 2013); a wide range of factors including personal and contextual characteristics can influence implementation success and, in turn, the impact of the intervention on health and wellbeing outcomes (Fixsen et al. 2015; Powell et al. 2015).

A central issue in the field of implementation science involves understanding and identifying the mechanisms which facilitate implementation success (Lynch et al. 2018; Nilsen 2015). Proctor et al. (2011) propose an Implementation Outcomes (IO) taxonomy developed to promote clarity and consensus with regard to the various terms used in relation to implementation outcomes. These include programme adoption, feasibility, fidelity, acceptability, and appropriateness. "Adoption" refers to the intention to use a particular evidence-based intervention/practice, also described as the "uptake" of an intervention. The terms "feasibility" and "fidelity," on the other hand, refer respectively to the successful utilisation of an innovation and the quality of delivery/ adherence to intended implementation protocols within organisational or service settings. The "acceptability" and "appropriateness" of an intervention describe respectively stakeholder satisfaction with the programme (including the perceptions of programme/practice utility) and compatibility with, or relevance to, the implementation setting. Although often treated synonymously, "appropriateness" and "acceptability" differ, in that whilst an evidence-based programme may be relevant and an appropriate fit with a given implementation setting, it may be unacceptable to providers or practitioners. Overall, implementation outcomes relate to implementers' expressed attitudes, opinions, values, intentions, and/or behaviours. These outcomes are important as they reflect the impact of strategies and efforts designed to implement innovations within service settings (Proctor and Brownson 2012).

Multilevel, theory-driven approaches to understanding how implementation outcomes are shaped are important and can help to identify patterns of interaction between programmes, stakeholders, and the context in which implementation occurs (Chaudoir et al. 2013). Damschroder et al. (2009) developed the Consolidated Framework for Implementation Research (CFIR) from a synthesis of existing implementation theories and frameworks; this offers a typology of constructs believed to influence implementation across the domains of an intervention, the context of programme delivery, the organisational setting, and the people and processes involved in implementation (Damschroder et al. 2009).

The use of this kind of framework can help to promote a deeper understanding of how these interactions shape, either positively or negatively, the implementation and impact of a programme (Lynch et al. 2018; Nilsen 2015).

The development of causal theories aimed at understanding the relationships between determinants and implementation outcomes is increasingly recognised as a priority for furthering our understanding of the science of implementation in a primary health care context, including—but not limited to—the delivery of child and family psychology and psychiatry services (Williams and Beidas 2019). Group-based early parenting programmes are an increasingly popular prevention and early intervention strategy. A significant body of research supports the effectiveness of targeted parenting programmes for parents and children at risk of conduct disorder (e.g. Furlong et al. 2012; Leijten et al. 2018); however, gaps remain in our understanding of the effectiveness of group-based parenting supports when implemented as a universal, preventative strategy for parents and their very young children (Lindsay and Totsika 2017). Moreover, although there is growing emphasis on understanding the process factors that influence the effectiveness of parenting programmes (O'Brien et al. 2019), a lack of theory-driven implementation research in this area has been highlighted (Davidoff et al. 2015; Olofsson et al. 2016). Indeed, our understanding of what constitutes effective, universal early parenting intervention has been hampered by a lack of clearly delineated implementation protocols and insufficient attention to the mechanisms underpinning implementation effectiveness (Hurt et al. 2018). Overall, research grounded in conceptual frameworks is crucial for the development of an adequate understanding of "what works" in terms of the real-world implementation of evidence-based supports and services (Barwick et al. 2019; Leviton and Trujillo 2017).

Study Aims and Objectives

The overarching aim of this study was to explore the successes and challenges of implementing a complex, group-based, early parenting intervention—the Parent and Infant (PIN) programme—in real-world, community-based settings. The specific objectives were (i) to consider implementation outcomes in the context of the new PIN programme, (ii) to draw on an established conceptual implementation framework (the CFIR; Damschroder et al. 2009), to explore the facilitators and barriers experienced during delivery of the PIN programme, and (iii) to subsequently explain the person-programme-contextual interactions which influence implementation success.

The PIN Programme

The PIN programme is currently being delivered in two sites in the Republic of Ireland: West Dublin and in Drogheda and Dundalk in the North East of the Republic of Ireland) (see www.archways.ie). The programme comprises a range of group-based supports offered to parents when infants are aged approximately 2 months old; these involve the delivery of the 8-week Incredible Years Parent and Baby Programme (IYPBP), alongside complementary programmes and workshops (including baby massage classes, weaning workshops, and first aid). Once the child is approximately 18 to 28 months old, parents are offered additional supports which include the Incredible Years Parent and Toddler Programme (IYPTP). Thus, the programme combines standardised behavioural parent training (e.g. the two Incredible Years (IY) programmes; Webster-Stratton 2015), with a range of additional, developmentally tailored supports. These supports are also tailored to the needs of the community/site where the programme is delivered; thus, there are some minor differences in programme composition between the two delivery sites (see Table 1). Overall, the PIN programme aims at improving parent competency and wellbeing, strengthening parent-child relationships, and enhancing child developmental outcomes. The development and installation of the programme was undertaken to establish and embed collaborative, multidisciplinary and cross-sectoral family support whilst also strengthening organisational capacity in children's services (withheld).

The areas where the PIN programme was delivered had an established history of implementing the IY suite of programmes in community settings (e.g. local schools and community centres). Programme implementation is supported by the Area-Based Childhood (ABC) initiative, a government-funded prevention and early intervention initiative aimed at tackling and reducing childhood disadvantage and inequality (Hickey et al. 2018). The programme is delivered by Public Health Nurses (PHNs) in collaboration with other statutory and non-statutory community-based services (e.g. Family Support Workers, Health Officers). The delivery of the PIN programme is supported in each site by a small number of programme personnel who provide administrative support for programme delivery, whilst implementation is also overseen in each site by an Implementation Team which comprise a network of key programme delivery partners (e.g. PHNs, social care workers, and PIN programme staff) and meet on a monthly basis during cycles of programme delivery.

Study Background

A large-scale evaluation of the PIN programme (entitled (withheld)) was established in 2014 and involved a non-randomised controlled trial and accompanying economic

Table 1 Parent and infant programme components

Components	Core topics	Objectives
Incredible Years Parent and Baby programme (8 sessions)	Getting to know your baby; Babies as intelligent learners; Providing physical, tactile and visual stimulation; Parents learning to read babies' minds; Gaining support; Babies' emerging sense of self	• Strengthen parent knowledge and self-confidence through learning about babies' development and developmental milestones • Enhance parent-infant relationships and parental competencies, prevent infant maladjustment and promote infant wellbeing through skills and techniques to support learning and development and healthy behaviours (feeding, sleeping, calming babies) • Empower parents through learning about self-care and gaining support
Baby Massage (4 sessions)	Relief—colic and wind; Emotional stress; Relaxation—soothes and aids sleep; Stimulation—build immunity and help gain weight; Interaction—aid bonding and reduce postnatal depression	• Enhance parent-infant bonding and alleviate infant stress • Promote parental sense of competence and wellbeing (e.g. reduce postnatal depression)
Weaning workshop (1 session)	Stages of weaning, timing, quantities, feeding techniques; Food safety and hygiene; Healthy eating principles; Practical cookery demonstration and advice	• Enhance parents' knowledge/-competencies in relation to healthy eating • Increase healthy eating behaviours • Prevent early weaning
Paediatric First Aid workshop (1 session)/child safety[†] (1 session)	Child resuscitation; Dealing with injury, poisoning, choking, and medical emergencies; Recovery position; Threats to child safety and child proofing home environments	• Prevent/reduce incidents of injury to infants through parents learning first aid skills and baby-proofing home/environments techniques; and • Enable parents (promote sense of competence) to identify, remove, and respond to threats
Dental health[†] (1 session)	Principles of dental health	• Increase parents' awareness of oral health

Table 1 (continued)

Components	Core topics	Objectives
		• Improve parents' knowledge/-competencies in relation to oral health
Toddler healthy eating (1 session)	Food safety and hygiene Healthy eating principles Practical cookery demonstration and advice	• Enhance parents' knowledge/-competencies in relation to healthy eating • Increase healthy eating behaviours
Returning to work workshop (1 session)	Information on childcare options Guidelines for choosing childcare	• Empower parents/reduce parental anxiety in relation to returning to work
Active play[†] (2 sessions)/play and oral language development programme* (4 sessions)	Play skills and strategies Language development milestones Practical play sessions and advice	• Strengthen parent knowledge and competencies through playing skills and strategies • Enhance parent-child relationships and encourage child wellbeing through play • Promote child language development and pre-literacy skills
Incredible Years Parent and Toddler Programme (8 sessions)	Child directed play promotes positive relationships Promoting toddler's language with child directed coaching Social and Emotion coaching The art of praise and encouragement Spontaneous incentives for toddlers Handling separations and reunions Positive discipline—effective limit setting Positive discipline—handling misbehaviour	• Strengthen parent knowledge and self-confidence through learning about toddler development • Enhance parent-infant relationships and parental competencies, prevent child maladjustment, and promote socioemotional wellbeing (e.g. self-regulation and self-esteem) through building parent' coaching/modelling skills and play skills and strategies • Promote child language development and pre-literacy skills

[†] Delivered in Site 2 Drogheda/Dundalk only

*Delivered in Site 1 West Dublin only

appraisal. The findings emerging from this trial indicate that the programme resulted in improvements to parenting sense of efficacy, as well as perceived benefits in terms of enhanced parental knowledge and skills and reduced parenting stress and sense of isolation in the transition to parenthood

(withheld; withheld). To date, a very small number of studies have explored the effectiveness of the IYPBP and IYPTP. Jones and colleagues reported positive outcomes of the IYPBP on parenting confidence and sensitivity, but no impact on child developmental outcomes, whilst another evaluation did not find any benefits for parents or children (Pontoppidan et al. 2016). Tentative evidence suggests that the IYPTP may benefit parenting skills and child outcomes (Horwood et al. 2017; Hutchings et al. 2017). However, in these evaluations, the programmes were implemented with more at-risk groups and in a standalone manner, whereas here, the programmes were delivered and investigated on a universal basis and within the context of a larger suite of "wraparound-inspired" community-based supports for families.

A detailed, multimethod process evaluation of the PIN programme was undertaken to explore programme implementation (withheld). Here, we report on programme implementation and the contextual factors and mechanisms which shape and influence implementation outcomes and specifically adoption, acceptability, appropriateness, and feasibility. An overview of the findings in relation to implementation fidelity and attendance is available from the authors (withheld) and will be explored in more detail in a forthcoming paper; a detailed analysis of programme costs is also currently underway and will be reported at a later date (see website for further information).

Method

Study Design

The process evaluation was informed by previous implementation research (Baranowski and Stables 2000) which guided the development of a series of research questions and informed data collection (see Table 2). We had originally intended to assess programme reach, but this was not possible due to the unavailability of data on the rate of childbirths at community level in Ireland. The CFIR (Damschroder et al. 2009) was also used to inform data analysis and assist in the interpretation of the factors and conditions that influence implementation outcomes in the context of the PIN programme.

Data Sources

Data sources included documentary analysis, face-to-face interviews, and focus group discussions.

Documentary analysis included a review of a large number of documents including programme manuals ($n = 4$), implementation protocols and details ($n = 3$), or delivery materials ($n = 7$); materials/handouts for parents ($n = 9$); minutes from Implementation Team meetings ($n = 12$); minutes from meetings between the research team and key implementers (e.g. PIN

Table 2 Framework for Exploring Implementation of the Parent and Infant Programme

Priority areas	Research questions	Data sources	Salience for implementation outcomes
Implementation	• What were the characteristics, processes, and structures which support delivery of the intervention? • What training, guidance and information did implementers receive? • How did implementation progress over time? • Who delivered the intervention and how well was the programme attended?	Documentation Interviews/group discussion Impact evaluation data Parent participant feedback Documentation Interviews/group discussion	Adoption Feasibility
Responses	• How did key stakeholders experience and respond to, and perceive, the intervention? •Which aspects of the programme were deemed most useful?	Documentation Interviews/group discussion Stakeholder feedback Parent participant feedback	Acceptability Appropriateness
Facilitators and barriers	• What influenced key stakeholders responses to the intervention? • What were the challenges to implementation?	Interviews/group discussion	Mechanisms which impact implementation outcomes
Context	• What were the characteristics of the service environment in implementation occurs? • What broader conditional factors impacted on key stakeholders' experiences?	Documentation Interviews/group discussion	Contextual factors which impact implementation outcomes

programme coordinators/developers) ($n = 20$); and reports/presentations produced by programme developers ($n = 4$). Regular contact/meetings between key stakeholders involved in programme implementation provided important and useful insights into the development of the PIN programme and progress in relation to implementation, recruitment, operational activities, and any planned and/or unplanned or forced changes to programme components and its delivery.

One-to-one semi-structured interviews and focus groups were conducted with a wide range of stakeholders including programme implementers, personnel from participating organisations, PIN programme staff, and parent participants. These explored experiences of participating in the PIN programme, stakeholder responses, barriers and challenges to implementation, and the conditions within which the programme are delivered (e.g. motivations, attitudes, perspectives, organisational infrastructures, and policies).

Participant Recruitment and Interview/Group Discussion Procedure

A purposive sampling method was used to recruit a wide and diverse range of participants to the process evaluation. Key inclusion/selection criteria for programme implementers include the participants' role in programme development and/or delivery and their ability to provide insights into the key issues influencing, and affected by, programme development and implementation. A subsample of parent participants was recruited for participation in interviews, from the larger impact evaluation of the PIN programme ($n = 106$) using a number of factors including key demographic variables (e.g. socioeconomic disadvantage, marital status, age, parity, and gender of child), programme delivery cycle, and level of programme engagement (e.g. no. of sessions attended).

In total, 44 one-to-one or small group interviews (2 participants per group) were conducted with key stakeholders including (i) personnel involved in programme development

and set-up, implementation planning and support/facilitation, and/or programme delivery ($n = 22$); and (ii) parent participants ($n = 22$). Prospective parent participants were asked during data collection sessions for the larger controlled trial to take part in face-to-face interviews, and a separate time for these interviews to take place was arranged. Programme implementers were contacted via email or telephone. All programme providers who were contacted agreed to take part in the research; four parents declined to take part, citing lack of time and unwillingness to participate.

Additionally, six focus groups were conducted with programme implementers, involving a total of 18 participants (6 of whom had previously participated in one-to-one interviews); one further focus group discussion involved 6 parent participants who had participated in an IYPTP group but were not part of the larger PIN trial. This additional recruitment was undertaken due to the low numbers of participants in the larger trial who took part in the IYPTP. The recruitment of participants throughout the process evaluation is shown in Supplementary Figure 1.

Four researchers, who were also involved in collecting data as part of the larger PIN trial, conducted the interviews and group discussions; all had considerable experience of qualitative research. Participating stakeholders were provided with information sheets regarding the process evaluation and their written informed consent was obtained. Participants also consented for interviews/group discussions to be audio recorded and were allocated unique codes to ensure participant anonymity; interviews with stakeholders involved in programme development and delivery were identified as "SIx" (x = participant number), whilst parents are identified as PIx. Focus group participants were identified as FGx.

Participant Characteristics

Programme Developers/Implementers

Participants in the one-to-one or small group interviews included community-based service managers ($n = 4$), PHNs and Nurse Managers ($n = 6$), family support workers, and community-based practitioners/volunteers ($n = 12$). Focus group participants included programme facilitators and implementers, most of whom were PHNs ($n = 10$).

Parent Participants

Parents who took part in interviews included 22 mothers who were aged, on average, 32 years (SD = 6.2), over half of whom (55%; 12/22) were first-time mothers and came from low-income families. Focus group participants included 5 mothers and 1 father who had recently taken part in the IYPTP. These participants did not participate in the effectiveness trial of the PIN programme and, therefore, their demographic details were not collected.

Data Analysis

A standard thematic analysis was used to interrogate the qualitative data (Braun and Clarke, 2006) and involved four key stages: familiarisation, coding, defining themes, and interpretation. Familiarisation involved an in-depth reading of all the data, followed by identifying initial codes to explain the data. The data was independently coded by two members of the research team (GH and YL), who were also involved in conducting interviews and focus groups with key stakeholders. Codes and findings from varying data sources were triangulated. Subsequently, codes were integrated into themes and examined against Proctor's IO taxonomy and the CFIR to finalise their operationalisation and to categorise themes into core implementation outcomes and domains (e.g. intervention, setting, individuals, and process). The research team were not involved in any way in the design, development, or implementation of the PIN programme. The analysis process was supported by the use of MaxQDA, a qualitative data analysis software package. COREQ guidelines (Tong et al. 2007) were used to guide the analysis and reporting of findings.

Results

Implementation Outcomes—Delivery Progress Over Time and Stakeholder Responses During 2014 and 2016, during the course of the effectiveness trial and process evaluation, three cycles of programme delivery were initiated in both sites, involving 12 parent and baby groups and four parent and toddler groups. Cycles of programme delivery begin respectively in January, February, and September with the delivery of the IYPBP (8 sessions) to groups of parents (approximately 10 parents per group). The IYPBP sessions were delivered fortnightly, with complementary workshops and supports provided to parents in the interim (7 wraparound workshops). At a later date, parents are offered the IYPTP (12 sessions), whilst in Site 1, only additional healthy eating, as well as play and oral language development supports (5 sessions), is also provided. Practitioners who delivered the IY elements were all fully trained (all facilitators had received three-day training in the context and techniques of the IYPBP/IYPTP). Each IYPBP was delivered by three practitioners, whilst the IYPTP was delivered by two practitioners (PHNs and community-based practitioner working collaboratively). Baby massage was delivered by a fully trained massage therapist (either a PHN or another community-based practitioner) who was certified by the International Association of Infant Massage; whilst other components which form part of the PIN programme, include non-standardised content which was delivered by appropriately trained or qualified personnel.

The analysis of qualitative data from both parents and implementers, points to positive perceptions of, and high levels

of satisfaction with, the PIN programme. These findings suggests that there was a general consensus between key stakeholders in relation to programme acceptability; they also provide evidence of perceived programme benefits and suitability for new mothers, including enhanced support and reduced anxiety/stress during the transition to parenthood as well as improved parenting skills and confidence (Box 1).

Box 1 Perceived benefits of the PIN intervention

Perceived benefits for parents

- "[Those parents] would be from a very different social class and yet they bonded through that time. […]it got them all through those few months together. Now they may not have anything in common when people go back to work because their lives are so different, but yet for that time they had that connection." (SI12)
- "You can see that the mums are far more engaged with them... You know, with the babies... When they are undressing them and they are doing things... There's a lot more positive communication, a lot more descriptive commenting […]. So the way that they are communicating with their baby is very, very different and it's a lot more descriptive in nature. […] My colleagues have noticed that as well." (FG1)
- "I think it has really empowered parents, you see by the end of it, I think it is just so empowering because they realise that they know their babies."(SI13)
- You just feel like you are more plugged into a network, plugged into a community and on a very practical level you can chat to other mums and say does your baby do this?:::You feel less alone and isolated. (P16)
- I did not know where to start with [baby] and doing the programme helped me a lot like. Helped me in different ways like. I was always the person with the question! (P7)
- "the importance of being there with the child and talking and playing:::How you interact and communicate with your child has a big impact on how development is… He is very curious, he's very interested in things and I'm sure that has been because we have been more focused on interacting with him a lot more." (P2)
- "She definitely picked up something from me speaking very kind of descriptively to her even though I did not know the benefits of it at the time. And that's certainly something I'd never have considered doing with a new baby." (P21)
- "I feel like I am calmer now […] I used to not have five minutes for myself because everything was go, go, go." (FG6)

Perceived benefits for practitioners and organisational capacity development

- "It's hugely enriched my... working with my parents, even the ones who are not doing the groups. I would bring the same sort of ideas around managing different things and working out different things." (SI13)
- "for our own staff it has their own practice, they use the techniques or the thought process or the tips and ideas in their own practice as well." (SI16)
- "It is very worthwhile and I think a lot of people would say it is kind of their sanity, or the real positive experience within their job because, I mean our job sometimes can be, even though it is very rewarding, it sometimes can be very difficult because we are dealing with very complex vulnerable families, very sick people." (SI12)
- "I think it is a whole service change and it is also linking up, say the likes of the [Community Centre], the services they deliver. So I think it is actually linking up a lot more people and even the community centres, […] at least they know what services are around" (SI2)
- "It would equally build, and as I say I would like that to be within the health centres if at all possible because for the families there, oh I was up in the health centre, it is a lovely place, we had a lovely room, we had a lovely group. That demystifies what this health centre. And if it is

a case that they are going for any other checks or appointments, they know where it is, they know the system. And that fear factor is taken from them." (SI16)

Despite evidence pointing generally to the acceptability of the programme, the findings from the interviews also point to some minor differences of opinion between practitioners and some parent groups. Whilst practitioners felt that the programme was relevant for all parents, some parents suggested that the perceived relevance of programme content was sometimes attenuated by older infant age and/or the parents' prior experiences (e.g. second-time parents). Additionally, narratives from a smaller group of parents who participated in the IYPBP indicated that they were not always accepting of programme content and/or the advice offered by other parents and/or facilitators during group sessions. There appeared to be a disconnect, in particular, between the promotion by the facilitators of what was perceived to be a parent-led approach to infant sleep routines, versus a more child-led approach. These findings suggest that at least some parents were selective in their application of the parenting techniques and information offered during the course. However, this did not appear to detract from parents' enjoyment of the course. Indeed, there may also have been positive—if perhaps unintended—outcomes from this active critique by parents of the programme. Thus, parents felt that they were actively choosing the "type" of parent they were hoping to be and were empowered, through their participation in the PIN programme, to feel confident and secure in this choice:

> "In the room there's a mixed pot of people and other people… certain things are important to them and you might feel that you don't form the same opinion as them. [...] it's having the confidence to figure out what type of parent you want to be." (PI1)

Enthusiasm for the PIN programme was, overall, a strong feature of the practitioner narratives, which highlighted positive experiences of programme delivery (Box 1). However, there were also perceived challenges to programme adoption and feasibility, particularly in Site 2, where stakeholders felt that additional work and time were needed to generate greater buy-in for programme delivery, particularly amongst PHNs. Indeed, fewer parent and baby groups were delivered in Site 2 and this was due, at least in part, to a lack of adoption. More generally, stakeholders also reported difficulties in balancing programme delivery with other work responsibilities, indicating at least some challenges to programme feasibility. Facilitators and barriers to implementation are discussed below. Subsequently, we explore how these facilitators and barriers interact with the ecological system of programme intervention.

Facilitators and Barriers

The facilitators and barriers that influenced implementation outcomes were categorised using the CFIR and included (a) programme characteristics and processes, (b) person level factors, (c) contextual factors including the characteristics of the organisations involved in programme delivery, and broader, structural factors. An overview of the findings is shown in Table 3

Programme Characteristics and Processes

Advantages of the PIN Programme The PIN programme was perceived as conferring professional and personal benefits, as well as helping to address an area of need/gaps in current service provision for parents and young children. The programme content and the mode of delivery were appealing to local stakeholders, and there was general endorsement of the importance of preventative and early intervention supports which were multidisciplinary and collaborative, as a means of enhancing child developmental outcomes. Stakeholders were very positive, overall, about the group-based format of the programme and a positive group dynamic was perceived as critical to the implementation process and central to promoting relevance and usefulness for parents.

Programme Resources Overall, the availability of sufficient resources (including access to programme materials and appropriate venues) and funding, and the presence of operational and administrative supports (e.g. dedicated programme personnel and an Implementation Team) were also identified as crucial implementation facilitators. These helped to increase the perceived feasibility of the programme and facilitated practitioner involvement in implementation, as they helped to reduce the costs and attendant risks for partners in the implementation process.

Table 3 Main themes and sub-themes relating to facilitators and barriers to programme implementation

Programme characteristics and processes
• Advantages of the PIN programme
• Programme resources
• Capacity development
• Reflective implementation planning

Person level factors
• Participant attitudes and ability to engage
• Practitioner qualities and attitudes
• Practitioner practice v. competing demands

Organisational factors
• Supportive dynamics
• Leadership engagement
• Networks and communication
• Organisational climate
• External policies

Capacity Development Support for building capacity, including the training provided to support the delivery of the various components of the PIN programme (IY and Baby massage), was identified as important for promoting programme adoption, acceptability, and appropriateness. However, coaching, peer support, and "on the job" support provided by pairing experienced and less experienced staff for programme delivery was highly valued by practitioners. Indeed, training alone was necessary, but not sufficient in promoting programme delivery involvement. In other words, ongoing support was needed. Notably, support was perceived as not just practical and focused on skill development but also important in terms of an emotional or "moral" element and building practitioner confidence. Thus, this capacity building was helpful in addressing any early fears felt by practitioners when hosting a group-based programme and the attendant changes in practice, thereby facilitating involvement and continued participation:

> "They were really quite frightened to be able to stand in front of groups of people. Most Public Health Nurses have never stood in front of a group of people in their lives [...] the meat on the bones was the support that was provided to the facilitators." (SI1)

Reflective Implementation Planning Proactive, reflective planning for programme implementation was led by PIN programme staff and Implementation Teams and involved gathering and assessing regular feedback on programme implementation from parent participants and facilitators. Implementation team meetings were held on a monthly basis during cycles of programme delivery. This approach was identified as important for enhancing feasibility and appropriateness and in enabling implementation progression aimed at, ultimately, embedding and sustaining the PIN programme with the local service landscape:

> "We can reflect on what's working and what isn't working, what's been good, what worked for some." (SI9)

Person Level Factors

Participant Attitudes and Ability to Engage The interview findings suggest that, as with any new intervention, participants (in this case parents) need to be motivated and interested in attending the programme. Parents' interest and desire to interact with other new parents were understood to be key motivators for parent engagement. Conversely, stigma surrounding parenting programmes and/or discomfort

attending a group-based programme was identified as barriers to engagement:

> "You are also coming into a group dynamic and it can be intimidating, particularly if you are a hard to reach mum." (SI9)
>
> "...the profile of women in the group were kind of all like me, stable enough situations, stable enough families. [...] Other women out there who might have more chaotic situations, younger, no other experience of raising children might have benefitted." (PI11)

Parents' inability to attend due to lack of transport, absence of childcare, return to work, and/or due to lack of childcare supports were identified as barriers to attendance. Patterns of engagement may have also been influenced, at least in part, by a lack of perceived need for support and/or change in parenting behaviours.

> "I had assumed that the way I was brought up was the right way to do it, so I found it quite a challenge to unlearn that kind of stuff." (FG6)
>
> "The only struggle to get them to that lightbulb moment is if the parent isn't committed to bring the home activities home and actually work on them. If they do partake wholly then there is no struggle." (SI22)

Practitioner Qualities and Attitudes The personal qualities of programme providers were viewed as crucial to implementation outcomes. A warm, friendly, and non-judgemental approach and facilitators' ability to establish supportive relationships with parents was perceived as helping to promote a supportive intragroup environment, and ultimately a high level of parent engagement and satisfaction with the programme:

> "I did find [the group] supportive. [...] It can be hard initially in the first few weeks because nobody knows each other ... but it was a safe group process, it was a supportive group process." (PI12)

Practitioner commitment was also identified as making a meaningful contribution to successful programme implementation.

Practitioner Practice vs Competing Demands Practitioners felt that delivering a group-based parenting programme was a nuanced and complicated process and they identified a number of challenges in getting to grips with programme delivery. Indeed, substantial differences between routine PHN service delivery and PIN programme implementation were recognised, particularly the move to a group-

based, facilitative-collaborative model of service delivery. To reduce practitioner burden, facilitators did not deliver the PIN programme components across consecutive cycles of delivery—however, this meant that facilitators experienced long gaps between delivering groups (approximately 6 months) and many mentioned insufficient practice as a group facilitator, to be a significant concern/barrier when embarking on implementation. It was also noted that theoretical knowledge of what happens in a parenting group was different from how it was in reality. Thus, practical experience of running the groups (in a supportive context) was identified as helpful for promoting programme adoption and, over time, consolidating and maintaining skills:

> "Very scary at the beginning. I'd never been involved in group work so actually coming out of my safe place to stand up or sit down even and talk to a whole group - the whole thing was quite a big learning curve for me." (SI13)

However, practitioners noted that their involvement in programme delivery was often "additional" to their existing workload and that implementation required a significant investment of "man hours." Competing work demands and lack of time were the most frequently cited barrier to involvement in programme implementation. Thus, the need to balance regular involvement in the programme with other work commitments and responsibilities was crucial to promoting and sustaining programme adoption and feasibility. In this context, and as might be expected with any new service-based frontline innovation, a sincere recognition by the programme support team, of the additional demands placed on facilitators—and the need for supported delivery—was crucial to promoting practitioner buy-in and programme adoption.

Contextual Factors

Supportive Dynamics Supportive intra- and inter-organisational dynamics and interactions were identified as essential contextual components that impacted PIN programme implementation. Recognition and support from colleagues *not* involved in programme delivery were highlighted as influential. This included the willingness of peers to provide cover for providers whilst involved in programme delivery, as well as a more general atmosphere of support from colleagues for programme implementation:

> "...they're realising it's not just delivering for two hours, there's an awful lot more to it and once that kind of knowledge goes around and the talk is 'yeah, they're not just dossing off.'" (SI15)

Conversely, a lack of support amongst a practitioner's peers was perceived as a barrier to sustainable involvement in programme delivery. For example, one key informant noted: "I am the only Public Health Nurse in this health centre involved [delivering the PIN programme] and a barrier would be, 'oh she is gone again, or she is missing again.'" (FG1).

Notably, stakeholders in Site 1 felt that, as implementation progressed, a broad base of support for programme implementation had been developed and that over time, their colleagues who were not involved in delivery were, nevertheless, supportive of facilitators and their participation in PIN programme delivery. However, by contrast, key stakeholders in Site 2 felt that there was still a lack of understanding of the programme and involvement in delivery and that ongoing work was needed to increase receptivity for implementation.

Leadership Engagement Overall, leadership, which was in evidence at different levels of programme planning and implementation, was influential in firstly promoting programme adoption and acceptability and, secondly, in ensuring the feasibility of the programme over the longer term. Crucially, the championship of the programme from service managers was understood to be an important factor in ensuring access to adequate practical resources and human capital to enable delivery, and was, therefore, a vital aspect of the organisational context which enabled change in service delivery. Furthermore, this kind of support was fundamental to building buy-in for implementation and adoption throughout the organisation. For instance, in Site 1, service managers within the public health services provided additional time for facilitators to participate in preparation, as well as coaching. Facilitators, in turn, felt that this was instrumental in reducing stress and burden and, therefore, was fundamental to maintaining their involvement in delivery. Overall, leadership was an important factor in establishing a climate which was both supportive of the programme and which helped to reduce any resistance to implementation:

"We have a supportive [management] who has really supported it and has had encouraged and she would really like to see it go mainstream. I think having that support there... If we lost that it might be hard to convince other people but with [management] really supporting it, it has made a huge difference". (SI14)

Networks and Communication Positive inter-organisational relationships (e.g. within the PIN programme Implementation Team) and communication were identified as an important influence on implementation effectiveness. Firstly, at the level of delivery, collaborative, inter-organisational delivery was viewed by practitioners as facilitating a flow of information and support within the early years/ family service systems, whilst also improving coordination, understanding, and links across various community-based organisations. This, in turn, contributed to a broader process of service reform in early years of services catering for parents and young children, as well as capacity building amongst service providers.

"For me the approach that we have and it is a true collaborative approach because we have [Maria] in the resource centre and then [June] with all of her experience from the schools... You know, it's just... It's a very, very well working team that we have." (FG2)

Collaboration at a coordination level (i.e. within the Implementation Team) and positive inter-organisational relationships and communication were reported to have facilitated responsive and effective implementation planning and performance monitoring which, in turn, had enhanced programme feasibility:

"So there's always going to be stuff we'll get right or we'll get wrong or whatever and there has to be an atmosphere of no blame and if it went wrong how do we fix it or how do we do it better the next time, how do we keep going and keep the momentum going. (SI8)

Organisational Climate The resources available at an organisational level to support programme delivery were also identified as key to implementation. Crucially, insufficient resources to cover staff costs, personnel shortages, and/or staff turnover within services emerged as a barrier to implementation:

"They still have the same caseloads as they had this time last year so they are trying to fit this in on top of their normal work... So they haven't had any extra staffing to cover the time of the person delivering the programme." (SI4)

Notably, resource limitations appeared to be a greater concern amongst stakeholders from Site 2 where it was felt that there were significant challenges relating to personnel shortages and high workload amongst PHN providers in the area. Thus, despite a high uptake of training amongst practitioners, there remained challenges to the adoption and delivery of the PIN programme within the local PHN service.

Managerial support—or support for implementation at a "systems" level—was seen as central to leveraging and ensuring sufficient resources for programme delivery. The involvement of PHN management in PIN programme implementation appeared to be more in evidence in Site 1 than in Site 2 (e.g. more regular attendance at implementation team meetings). This may be due, at least in part, to the relevant personnel having prior experience of delivering parenting programmes. However, there appeared to be potential interactive effects between resource limitations and managerial support for implementation, in the sense that implementation support was more challenging for management working within systems where there were greater resource pressures.

External Policies Key stakeholders highlighted buy-in at a "systems" level as being crucial for programme implementation. Thus, top-down support for the programme was further seen as creating a more receptive environment for change and legitimising and promoting practitioner participation in implementation:

> "I think if you don't have that buy-in from the top, that's what kind of hinders it […] They need the resources. They need the time and all of that can only be given by senior management." (SI2)

Inadequate funding and current policies were identified as barriers to programme adoption and feasibility. For example, participants also highlighted service priorities and boundaries, which are established at a policy and systems level and which may conflict with priorities associated with the delivery of new evidence-based interventions; for example, allowing dedicated time for training preparation may conflict with achieving patient throughput. It was felt that this could undermine on-the-ground opportunities to invest time and effort in PIN
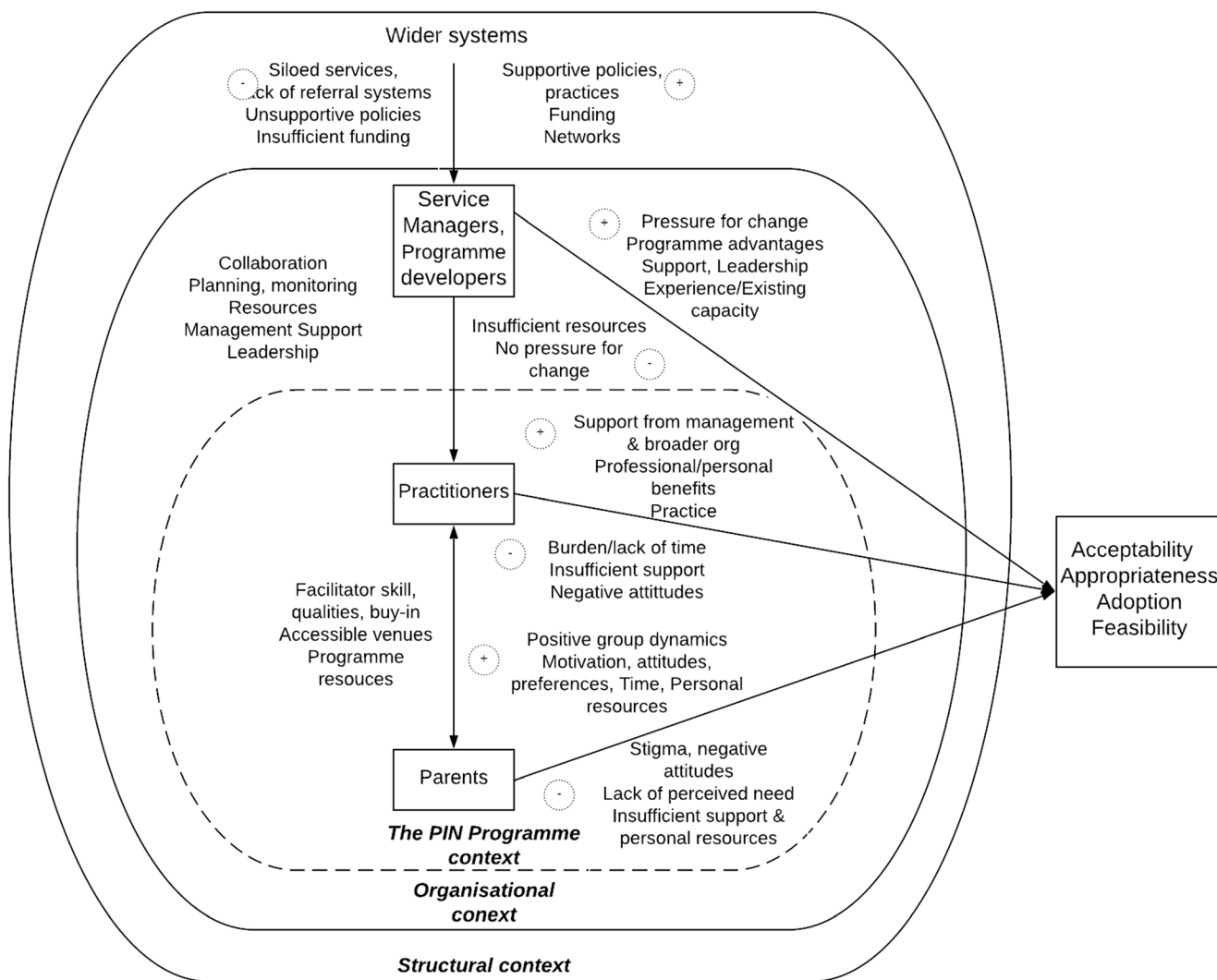

Fig. 1 A multilevel causal theory of PIN implementation outcomes

programme implementation. For instance, in Site 2, the programme is delivered in dual urban centres, and PHNs from one area cannot deliver in the other due to service restrictions, which limited the pool of available practitioners for each cycle of delivery.

Discussion and Synthesis

The collective findings from this study were used to inform the development of a multilevel causal theory of implementation outcomes (see Fig. 1). This enables us to understand how implementation outcomes were shaped in the context of the PIN programme by considering interactions between the programme, key stakeholders in the implementation process, and the contextual conditions within which implementation occurred. This approach helps to shed light on the contextually embedded and reciprocally interactive factors which influence the implementation of an early intervention and prevention programme within community primary health care settings and which may also be generalisable to, and help to inform, other similar implementation efforts elsewhere.

The collective findings reported here demonstrate—from the perspective of those who took part in the programme—that programme acceptability and uptake are greater when the mechanisms of positive group dynamics and participant motivation and supportive attitudes are triggered (Fig. 1). This requires skilled and committed facilitators/practitioners who can encourage and support participants (in this case, parents), as well as appropriate venues and resources, to promote intervention acceptability and appropriateness. These findings are in line with the small number of previous process evaluations of parent-training programmes which show that parents' feeling of support within the context of a group-based intervention, and perceptions of alliance with implementers, are important factors in the effectiveness of group-based parenting programmes (Akin et al. 2018; Stolk et al. 2008). Similarly, other studies have found that resistance to intervention can undermine the effectiveness of parenting interventions (Álvarez et al. 2018; Baydar et al. 2003). However, much of this existing literature has been conducted in the context of targeted interventions for at-risk parents and children. Our research, therefore, extends these findings to the implementation of group-based early parenting programmes delivered on a universal basis.

Our exploration of participants' responses also illustrates that the perceived acceptability, appropriateness, and adoption of the programme may be differentially influenced by programme characteristics and parent circumstances. For instance, it is important to note that the PIN programme was being implemented as a primary prevention strategy. Our findings suggest that parents' enjoyment of, and participation in, a group process had positive outcomes in terms of increased

parenting sense of mastery and reduced sense of isolation, regardless of parents' receptivity to, and/or adoption of, programme content. Thus, it is possible that parents of very young children who are not "at risk" require a less explicit focus on changing parenting attitudes, and greater attention on ensuring positive group dynamics, thereby promoting the development of supportive intragroup relationships and enabling and/or empowering parents and strengthening their sense of self-efficacy. However, this may only be optimal if participants are already positively disposed to the programme and perceive its group-based nature to be appropriate and acceptable to their needs. Indeed, fears around participating in a group-based programme were also perceived as a potential deterrent for others, particularly more disadvantaged or "hard to reach" parents.

These findings reflect those of earlier studies which indicate that stigma surrounding parenting programmes and fears around privacy may act as barriers to programme engagement (Furlong and McGilloway 2015; Zeedyk et al. 2003). However, to date, few evaluations of group-based parenting programmes have explored how programme characteristics may influence parents' responses and engagement with preventative and early intervention programmes (Olofsson et al. 2016). Poor parental engagement with universal preventative-focused early parenting interventions remains a significant issue and may be a significant factor in the mixed evidence around their effectiveness (Cullen et al. 2016; Gonzalez et al. 2018). Therefore, it is vital to strengthen our understanding of how engagement can be optimised. Our findings here may indicate that a greater awareness—amongst recruiters and programme providers—of participant attitudes towards different characteristics of the programme and how they may be shaped by their circumstances is important. Building such an understanding can help implementers to tailor their interactions with participants and provide some important insights into how the process of participant engagement may evolve and, in turn, be adapted through modified intragroup interactions to meet specific needs and priorities of parents, without impacting the core programmatic elements. However, our findings also show that engaging in this type of nuanced work is challenging for practitioners, particularly those who are time poor and/ or working within a context of resource constraints; this further underlines the importance of deepening our understanding of the person-programme-contextual interactions which influence implementation and programme success.

To date, few studies have explored the impact of programme factors on the implementation of group-based parenting programmes (Olofsson et al. 2016). From the perspective of those involved in delivery, programme acceptability and adoption can be achieved when frontline service providers hold positive perceptions of the programme and are afforded opportunities for "on the job" support and continuous capacity development support (e.g. coaching and peer support). In the

case of the PIN programme, these supports were important in helping practitioners overcome barriers to adoption, such as fears associated with the necessary changes required to routine practice. These findings further illustrate the importance of coaching-oriented resources which provides practitioners with both practical and moral/emotional support and encourages the development of both technical and "soft" skills (e.g. facilitator confidence); this also supports their ability to manage and respond to the nuances of dealing with parents in a group setting (Fixsen et al. 2005). However, it should be noted that greater barriers to implementation were experienced in Site 2 despite the fact that positive perceptions of the programme and capacity supports were present across both sites involved in programme delivery. Thus, even when perceived programme acceptability and appropriateness are high, programme feasibility and adoption may be undermined when perceived barriers to engagement (lack of support, lack of organisational resources, competing demands) persist. Thus, a variety of strategies and processes which can address barriers to implementation at multiple levels is needed.

The multilevel causal theory (Fig. 1) developed from our findings also illustrates how appropriate support and resources were helpful in alleviating perceived burden amongst practitioners and, in turn, encouraged positive attitudes towards, and involvement in, programme implementation. In the context of the PIN programme implementation, leadership from managers and the presence of programme champions at different levels of the programme infrastructure, as well as a general atmosphere of support from colleagues, contributed significantly to the development of a climate that encouraged participation whilst strengthening commitment and buy-in for the programme amongst individual facilitators. The lack of this type of support and particularly leadership from managers and understanding from colleagues, was arguably, a significant factor in the lower level of programme adoption in Site 2. Indeed, these findings are consistent with previous research which links organisational factors, such as leadership and organisational climate, to more positive perceptions of, and attitudes towards, evidence-based programmes Aarons et al. 2014; Brimhall et al. 2016; Jungnitsch et al. 2016).

The interview data in the current study illustrate that when practitioners perceive and/or derive professional or personal advantages from new programmes, they become more responsive which, in turn, enhances the appropriateness, feasibility, and sustainability of implementation. However, when the perceived advantages are outweighed by the perceived costs of implementation (e.g. additional burden, competing demands and lack of resources for implementation)—as appeared to be the case in Site 2—programme implementation may be undermined or indeed fail. These findings reflect those of other implementation research studies which suggest that the process of introducing innovation to practitioners requires due attention to facilitators' values, experiences, and perceptions

(Hickey et al. 2018; Laws et al. 2016; Thomson et al. 2015). Adoption amongst primary care and community-based practitioners who carry significant workloads—and who may often work in a context of limited resources—may be associated with stresses and challenges. Thus, creating an available support system and promoting a sense of personal and professional development as a consequence of implementation involvement may be particularly important in generating positive implementation outcomes, including stakeholder satisfaction, buy-in, and commitment to implementation.

At the organisational level, managerial support and buy-in were found to be critical mechanisms which supported implementation success and the achievement of core implementation outcomes—particularly feasibility, acceptability, and adoption. Prior experience and existing capacity may contribute to motivation for implementation, whilst support from initiating organisations (in this case the programme developers) can also help to establish managerial support for implementation. It is possible that implementation efforts elsewhere may benefit from identifying key actors within the organisation and providing capacity building supports and/or promoting interest in the programme early in the implementation process; this may, in turn, create positive knock-on effects in turns of cultivating an environment more conducive to practice change.

Collaboration between stakeholders was found to be important for programme adoption and implementation. Supportive and strong partnerships can help to support implementation capacity, as well as the quality of delivery. Infrastructures which enable and promote cohesive inter-organisational relationships and collaborative implementation planning are also vital. Indeed, Implementation Teams have been identified as key "linking agents" which can, in turn, facilitate constructive implementation planning and programme monitoring, thereby contributing to positive implementation outcomes (Fixsen et al. 2013; Crossland et al. 2019). Leadership for collaboration and positive inter-organisational interaction may also be necessary. In the context of the PIN programme, developers and programme staff provided a "lead" which facilitated the coming together of key organisations and relationship building. Indeed, leadership, a supportive culture, and positive working relationships between professionals have previously been found to facilitate collaborative implementation and joint working (Cooper et al. 2016; Sloper 2004).

The multilevel causal implementation theory developed as part of this study also outlines how perceived organisational benefits were an important motivator for management; adoption and promotion at an organisational level were facilitated by a perception of the programme as responding to organisational need and as helping to build organisational capacity. Innovation benefits and valued consequences have previously been identified as positively impacting

implementation success. For example, Damschroder and Lowery (2013) argue that the perceived relative advantages offered by a specific programme may be particularly relevant where there is existing pressure, or capacity, for change. For instance, buy-in at the management level may be undermined if organisational resource limitations are a pressing concern. External policies and systems, therefore, are also highly relevant and can exert significant influence on implementation efforts and the extent to which organisations and management therein feel enabled or motivated to run with an innovation. In the context of the PIN programme, these external factors were largely highlighted by stakeholders as potential barriers to implementation, further demonstrating the importance of examining and understanding implementation from a contextualised perspective (Ziemann et al. 2019). However, there was also optimism that growing recognition and support for prevention and early intervention at a political level would help to support the implementation of early parenting supports. Notably, the PIN programme was funded through a government initiative and this funding was perceived to be a key lever for positive implementation outcomes.

Importantly, modelling the factors which influence the implementation of these kinds of community-based initiatives within a multilevel causal theory is important in highlighting the interconnections between actors, the intervention itself and conditions in which implementation occurs, and, in turn, how these shape implementation outcomes. Indeed, implementation determinants at an organisational level, such as inter-organisational collaboration and management buy-in and support for practice change, may shape facilitators' experiences of programme delivery and help to cultivate positive perceptions of, and attitudes towards, evidence-based programmes. Facilitator enthusiasm for delivery, in turn, may reinforce and solidify managerial support for innovation. Additionally, facilitator skills and capacity building can be influenced by the availability of, amongst other things, organisational resources. However, facilitator skills also play a key role in influencing participants'/service users' experiences of, and responses to, the intervention. These kinds of reciprocal and dyadic interactions illustrate the multifaceted nature of the implementation process.

Study Strengths and Limitations

This study was limited in a number of ways. Firstly, no data were available to examine programme reach. Secondly, only mothers participated in the larger PIN trial and, therefore, also in the one-to-one interviews conducted as part of the process evaluation. Thirdly, due to resource limitations and to reduce stakeholder burden, we did not collect data on the background characteristics of facilitators, nor did we assess innovation receptivity/climate more broadly across the participating organisations.

At the same time, the study is based on a large amount of mainly qualitative data which provided important, in-depth,

and detailed accounts of stakeholders' experiences, perceptions, and expectations in relation to the new PIN programme. A broad range of stakeholders and a large sample of participants were involved in data collection, whilst interview/group discussion data were triangulated against findings from a comprehensive documentary analysis, as well as quantitative feedback from parents and programme providers and data from the accompanying impact evaluation. The use of established implementation frameworks and recommended construct terminology (e.g. Damschroder et al. 2009; Proctor et al. 2011) in this study helped to frame the analysis within the broader implementation science literature, thereby enabling comparisons with other intervention studies. This can help to build a broader understanding of the kinds of factors that are integral to successful and effective implementation of early parenting interventions and increase the generalisability of the findings to other contexts (Barwick et al. 2019).

However, in line with previous research in this area (Olofsson et al. 2016; Safaeinili et al. 2020), we found a lack of focus within existing frameworks on the role of the client or, in this case, the parent. Given the "active" role of the parent within group-based parenting programmes and the importance of peer-led learning and peer support therein, parents are not just recipients of an intervention; rather, they are operative partners in the implementation process. Indeed, our findings illustrate that parent attitudes, preferences, and priorities are important factors and can influence considerably the acceptability and uptake of group-based parenting supports, whilst intragroup relationships and cooperation were also found to be important ingredients for implementation success. The findings also provide important insights into the implementation of a community-led implementation initiative and exemplify how established implementation frameworks may be modified for application to "real-world" implementation efforts in primary healthcare systems. Indeed, the theory-building approach adopted here highlights important and potentially generalisable lessons for the implementation of innovation efforts more generally in community-based service settings.

Conclusion

The integration of a new intervention into existing services is a challenging multifaceted undertaking and a wide range of factors, conditions, and processes must be considered in order to support successful implementation (Kilburn et al. 2017; Szapocznik et al. 2015). Ineffective implementation can undermine the impact of interventions in any field. Despite recent growth in the field of implementation science, there remains a critical dearth of real-world examples of theory-driven implementation research in relation to parenting interventions and child and family service innovation (Akin et al. 2017; Barwick et al. 2019; Williams and Beidas 2019). This study addresses an important knowledge

gap and provides critically important information on the mechanisms that influence implementation success. Importantly, the study illustrates the application of established implementation frameworks to a real-world example involving the delivery of a complex, group-based, universal early parenting intervention in community-based, and primary care service settings. Thus, our findings, which relate to interrelated processes, factors, and contexts and their influence on implementation success help to "flesh out" existing and popular implementation taxonomies (Damschroder et al. 2009; Proctor et al. 2011). Putting the "meat on the bones" in this manner demonstrates how these frameworks can be used to identify and, in this instance, extend causal theory within implementation research in order to build a greater understanding of "what works, where and why" in terms of effective community-based public healthcare interventions, particularly those focused on early intervention and prevention.

Compliance with Ethical Standards

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

Ethical Considerations Ethical approval for this study was obtained from (withheld) Social Research Ethics Sub-Committee and the Health Service Executive (HSE) North East Area Research Ethics Committee. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent Written informed consent was obtained from all participants included in the study.

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