Child health interventions delivered by lay health workers to parents: a realist review

Abstract

There is a growing body of evidence that lay health worker (LHW) interventions are a cost-effective model of care which can improve health outcomes and reduce the burden on existing health and community services. Nonetheless, there is a dearth of information to specify which intervention characteristics contribute to their success. This realist review aimed to identify how, why and in what context UK-based LHW interventions aimed at improving child health parenting behaviours can lead to health promoting behaviour and improve child health outcomes. Results show that the 'peer-ness' of the LHW role gives parents a sense of equality with, and trust in, LHWs which facilitates continued engagement with interventions and sustained positive behaviour. Training and support is crucial to retention of LHWs, enhancing confidence and perceived value of the role in the context of the intervention. LHW interventions which are embedded within communities as a result of stakeholder buy-in demonstrate stable models of delivery and ease the burden on existing health and community services. In conclusion this review found that LHW interventions can positively influence child health parenting behaviours in certain contexts and provides program theory to inform future development of LHW interventions.

Introduction

Lay Health Worker (LHW) delivered interventions are increasingly used to address health behaviours and improve health outcomes within communities experiencing socio-economic deprivation (Lewin et al., 2005; Cook and Wills, 2012; Dugdill et al., 2009; Haider et al., 2014). LHWs do not require formal professional education or accreditation to deliver the role, but instead are recruited for their personal qualities or commonality with the target population (Cook and Wills, 2012; Lewin et al., 2010; Dykes, 2005). Consequently, LHWs are seen to bridge the gap between health services and the community (Dugdill et al., 2009). Due to the lower costs of training and remuneration compared to professionals, and the provision of care within home settings, LHW interventions are a potentially cost-effective model of health and community care (Lewin et al., 2010).

A growing body of literature reports on the effectiveness of LHW interventions, particularly within low-middle income countries (Lewin et al., 2005; Lewin et al., 2010; Lewin et al., 2006), yet has failed to identify the specific elements associated with successful outcomes. LHW interventions have been criticised for a lack of defined program theory and ‘unknown or poorly articulated’ mechanisms of change (Gale et al., 2018), including a poor evidence base for the context in which these interventions are effective. It is argued that the heterogeneity of delivery and content of LHW interventions means there is insufficient evidence to draw conclusions surrounding best practice (Mitchell et al., 2019).

A 2013 Cochrane review exploring LHW interventions for maternal and child health showed that success was, in part, tied to programme acceptability and credibility; and that support from health systems and community leaders (including health professionals) were central in achieving credibility. Intervention participants

responded positively to their shared commonality with LHWs which emphasises the importance of LHWs as peers; training (particularly in counselling) and peer support were deemed essential for successful delivery of the role (Glenton et al., 2013). While this review provides some theoretical basis for effectiveness, the authors acknowledged further work was required to better understand which components of LHW interventions influence success.

LHW role within Childsmile

Following decades of high rates of dental decay and low rates of dental registration among children living in Scotland, in 2010 a national oral health improvement programme for children (Childsmile) was rolled out (Macpherson et al., 2015). Since then, Childsmile has been incorporated into mainstream dental services across Scotland and provides holistic dental care to all children aged birth to 12 years. Yet, inequalities in oral health between the most and least deprived areas of Scotland remain. Accordingly, Childsmile is underpinned by 'Proportionate Universalism' which recognises that in order to reduce the gradient of health inequalities health action ought to be universal, however the intensity of action should be proportionate to disadvantage and need (Marmot et al., 2020). While elements of Childsmile are provided to all children, there are targeted components designed to affect change in oral health inequalities. One such targeted component is Childsmile Community and Practice which is delivered in part by Dental Health Support Workers (DHSWs): LHWs who support families to engage with positive oral health parenting behaviours such as toothbrushing and attending dental appointments (Hodgins et al., 2018). Childsmile Community and Practice is linked with the Universal Health Visiting Pathway and families who are deemed, by the Health Visitor, to require additional oral health support are referred to the DHSW.

Ongoing national Childsmile evaluation has uncovered substantive gaps in the program theory underpinning the DHSW role and variation in delivery (including referral criteria for DHSW support; Eaves et al., 2017). In keeping with Medical Research Council evaluative guidelines, evidence of the factors which contribute to the success or otherwise of LHWs is required to guide further development of the DHSW role.

Aims

The aim of this review was to identify how, why and in what context UK-based LHW interventions which aimed to improve child health parenting behaviours can be effective. Findings would be used to enhance this component of Childsmile and inform the wider inequalities agenda.

Design

The research design was guided by the Realist and Meta-narrative Evidence Synthesis: Evolving Standards (RAMESES I) which offers guidelines for realist evaluation and synthesis including methodological clarity, publication standards, and principles of good practice (Wong et al., 2013).

As this realist review was a component study of the national Childsmile evaluation, findings will be fed back to the programme to optimise delivery of the DHSW role and enable future evaluation of impact.

Theory

A realist review or synthesis (terms are interchangeable) is a systematic theory-based approach to literature synthesis best suited for evaluating complex health and social interventions because it considers the various settings and participants involved (Pawson et al., 2004). Rather than focusing on summative evaluation of a

policy or intervention the focus of realist research is instead on the causal program theory underpinning it (Shearn et al., 2017). Program theory refers to how an intervention causes intended or observed outcomes, and can explain how, why and in what context an intervention does or does not work (Shearn et al., 2017). There are differences in how program theories are conceptualised across the discipline. For example, some distinguish between program theory and middle-range theory whereby the former is at a lower level of abstraction than the latter. Others argue that program theories which retain relevance across contexts are inherently already middle-range (Jagosh et al 2011). This is the position taken in this paper.

The goal of realist research is to explain the causal processes within an intervention. Causation is attributed to the mechanisms, which when triggered under certain contextual conditions can lead to outcomes (Dalkien et al., 2015). However, as some mechanisms cannot be directly observed (e.g. when they involve human emotion or reasoning) inferential methods are required to uncover them, including observing the contexts in which they are triggered and the conjunction with outcomes which occur (Shearn et al., 2017). This is achieved by explicating initial program theories surrounding causation and testing them using a heuristic called the ‘context, mechanism, and outcome (CMO) configuration’ (Jagosh et al 2011).

[insert table 1]

Compared to traditional reviews, a realist review can provide greater depth of detail about how and why an intervention does or does not work. This is because the focus is on the mechanisms, the context in which they are activated and the multiple outcomes they produce rather than solely on a predefined summative outcome (Pawson et al 2004). Put simply, a traditional review would seek to answer ‘does the

intervention work?', while a realist review would seek to answer 'how and why does the intervention work? For whom and in what context?'. Furthermore, a realist review rejects the methodological hierarchy commonplace with traditional reviews and instead acknowledges merit in triangulating evidence from multiple sources (Pawson et al 2004) thus providing a greater depth of evidence base to work from.

Methods

The key processes in conducting a realist review are: identifying the research question including developing initial program theories to test; literature search; identifying, selecting and appraising literature; and synthesis (Jagosh et al 2011; Pawson et al 2004).

Literature Searching

Comparative case studies, which drew on Realist methodology, were conducted as part of the Childsmile evaluation. These provided an evidence base surrounding delivery of the DHSW role in Childsmile and development of initial theories (Supplementary material 1). A librarian-guided literature search was developed to identify evidence to support or refute initial theories across medical, social science, and psychology disciplines. Literature searching was carried out in September 2015 and updated in August 2017. Free text and embedded thesaurus (e.g. MeSH) searches were developed for each database and where possible, restricted to English language and age range birth-18 years. No date restrictions were applied (Supplementary material 2). Hand searching identified records known to the review team and those not retrieved via database searching. In accordance with Realist review guidelines all records (including grey literature) which met the inclusion criteria were included for review. The literature search produced 5,358 records (Figure 1).

[Insert Figure 1]

Records were screened and included if they described or evaluated interventions designed to change parenting behaviours in relation to children's physical health, safety or injury prevention. Records were excluded if interventions were not delivered in the UK or in a home setting or focused on management of chronic conditions or palliative care (Supplementary material 3). Screening for inclusion was carried out by the Principal Researcher (PR) and three members of the review team. Disagreements were discussed until a consensus was reached and 44 records were retained. After contacting authors for companion materials and a citation search, a further 22 records were identified but of those seven records were irretrievable as they were either not available to authors or not in the public domain. The search strategy produced 59 records for 36 interventions.

Appraisal

Sources were appraised based on relevance and rigour to glean whether there was sufficient detailed information on each intervention to search for casual patterns. The appraisal tool (Supplementary material 4) adapted from Jagosh et al (2011) contained three questions:

1. Does the intervention provide details on the setting(s) or context of the intervention?
2. Does the intervention provide details on the content and strategies of the intervention?
3. Does the intervention provide details on the outcome(s) of the intervention?

All 59 records were appraised by the PR and one quarter appraised by two reviewers to agreed standards. Interventions which scored high or moderate on all questions

were retained. Sixteen interventions comprised of 35 records met the appraisal criteria and were included for synthesis (Supplementary material 5).

Data synthesis

Data synthesis was the process of CMO configuring which involved collecting all data pertaining to contexts, mechanisms, processes, and outcomes within an intervention; and piecing them together to build explanations which refuted or supported the initial theories.

The synthesis process was carried out in four steps: (1) All intervention records were read several times to aid familiarisation; (2) All information pertaining to the intervention including descriptions of contexts, mechanisms, processes, and outcomes was captured in a data extraction form (Supplementary material 6); (3) CMOs for each intervention were pieced together using information from the data extraction form; and (4) CMOs were grouped conceptually using the initial theories as a guide (e.g. signposting, peer-ness of the role) to create program theories. This process was iterative and overlapping. All steps were carried out by the PR and discussed with members of the review team until consensus was reached.

Findings and discussion

Sixteen interventions were included within the review (Table 2).

[Insert Table 2]

Twenty CMOs were identified and conceptually categorised into five program theories (Supplementary material 7).

Program Theory 1: Person-centred support tailored to need and that draws on community support networks, activates trust in the LHW, and over time empowers parents to achieve child health parenting behaviours.

A person-centred approach was a distinguishing characteristic of LHW support. This sets it apart from professional-based services which in comparison, often take the form of didactic provision of generic information (Beake et al., 2005).

> "Information may be provided in a theoretical, rather than person-centred or experiential form, and professionals may assume that their clients lack information about the benefits of health behaviours" (Beake et al., 2005)

LHW support was tailored to the family and focused on parents' socio-emotional needs. This activated parents' 'internal resources' (such as motivation, self-efficacy and confidence) to engage with the parenting behaviour.

> "The [LHW] reported that many mothers, especially with first babies, expressed anxieties about whether the baby was getting enough milk – as they cannot measure or see breast milk as with bottled milk. She discussed others way that women could 'see' or 'know' the baby was getting enough milk that would increase the mothers' confidence…such as feeling the let-down reflex and changes in her breasts." (Beake et al., 2005)

Tailored LHW support, delivered over time and within the family home, provided parents with continuity of care and gave LHWs the opportunity to get to know families and their specific needs.

> "Over the nine months that the [LHW] relationship lasts, there is some opportunity for development of understanding and deepening of trust. The [LHWs] get to know the women and are able to observe changes over time." (Gale et al., 2018)

Trust between LHWs and parents has been identified as a key mechanism for engagement with the intervention and subsequent positive outcomes (Gale et al., 2018; Suppiah, 2008). The trust which develops between LHWs and parents is credited to the unique peer-ness of the LHW role, which is discussed in greater detail in program theory two.

Findings from this review also highlighted that trust is a product of long-term person-centred support. This echoes a growing body of evidence that tailored, person-centred interventions (particularly socio-emotional support) are more effective than non-tailored interventions (Gale et al., 2018; Suppiah, 2008; Eyles and Mhurchu, 2009; Noar et al., 2007; Wanyonyi et al., 2011; Trickey et al., 2018). Further strategies of successful LHW support are: adapting the number of visits to parents' needs; providing assistance to overcome barriers to engagement with the behaviour; accommodating parents' availability; offering communication in other languages; and providing intervention content in an understandable way (Hodgins et al., 2018).

Findings in this review demonstrated a risk that socio-emotional support could induce passivity in parents and dependence on the LHW. This could lead to parents failing to mobilise their 'internal resources' and increase the risk of physical morbidity and poor mental health.

Signposting or linking parents to community support services was a strategy which triggered parents' self-efficacy to continue the child health parenting behaviour without LHW support.

> "…many women did not have family around to help […] or had very limited experience of young babies. Consequently they lacked confidence and basic practical knowledge such as how to change a nappy or bath a

> baby…rather than trying to provide all the support [LHWs] encouraged women to attend community groups and took opportunities to put women in touch with others for mutual support." (Dykes, 2005)

Furthermore, engagement with community services normalised and reduced threats to engaging with child health parenting behaviours, which sustained the behaviour for the long term.

> "…[LHWs] ran a weekly drop-in breastfeeding support group…the most important aspects of the group were talking about and seeing breastfeeding happen, getting consistent advice, and increase confidence…making new friends and talking about other problems…" (Ingram et al 2005)

LHW interventions which include signposting or which directly link families to community services, are reported to be more effective than those which do not (Hodgins et al., 2018). However, findings from this review suggests that trust between LHW and parent is a pre-requisite in facilitating signposting and successful parental engagement with community support.

Program Theory 2: Shared experience or commonality means parents see LHWs as 'one of them' which can facilitate positive engagement with the intervention and parenting behaviour.

As others have identified, the close relationship between LHWs and their clients is a strength of the intervention and arises because of a shared commonality (Glenton et al 2013). This review demonstrated that parents were suspicious of LHWs (or health professionals) who had little or no personal experience with the parenting behaviour and were more accepting of LHWs who drew on their personal or shared experience.

This shared commonality activates a sense of equality between parent and LHW, and mobilises parents trust in the LHW. Meanwhile the absence of shared experiences was more likely to result in provision of generic information and unrealistic guidance.

> "…professionals, who were seen by some women as too dogmatic or unrealistic. The following quotes illustrate the strength of feeling among women about the negative potential of didactic, impersonal approach: 'it's all very well saying you must breastfeed…but they don't know, they haven't done it'…'my gut feeling is that sadly the vast majority of professionals offering advice to new mothers on breastfeeding, they have no experience of breastfeeding themselves, and this creates a confusing discrepancy between advice offered and the realities of the experience'." (Beake et al., 2005)

LHWs recruited from within the community understood local cultural norms, the realities of life, and were perceived by parents as non-judgemental: which further enhanced their acceptance among parents. Other bodies of work also document such findings and emphasise the importance of LHWs being perceived as 'one of us' by parents (Gale et al., 2018; Glenton et al., 2013; Trickey et al., 2018; Eng et al., 1997; Dennis, 2003).

Findings from this review highlighted that a shared commonality with LHWs facilitated parental engagement with the intervention. This is thought to be attributed to parents perceiving the support to be personalised and coming from a position of empathetic understanding (Bull et al., 1999; Kreuter et al., 2000).

Furthermore, embedding socio-emotional support within the community via local LHWs provided opportunities for informal 'off-duty' support and bridged a gap between health services and families. The value of local knowledge and shared experiences of LHWs within a community is reported elsewhere (South et al., 2012). Others have found informal communication, including personal experiences or topics not focused solely on the intervention agenda, aids engagement with LHWs, and strengthens trust and rapport (Lundahl et al., 2013; Fenwick et al., 2001).

> "There was a consensus amongst staff that the local experience and background of [LHWs] had proved, as anticipated by most managers, to be beneficial in bridging cultural gaps. One [LHW] illustrated this point: 'We've a common ground, we're fae the same area, we aw use the same shops, we aw have the same kind of housing…we have the same problems that they've probably encountered, so [we] can relate…whereas somebody that's not from the area would say 'oh right' but they don't really know. But we know." (Mackenzie, 2006)

Recruiting LHWs with a shared linguistic and/or ethnic background improved Black and Minority Ethnic communities' access to health information. It also removed the need for a translation service which was thought to limit opportunities for person-centred care. LHWs who delivered support in a parent's first language provided a sense of reassurance that the family's needs were being considered alongside cultural/religious beliefs.

> "The parents' responses in this small study appear to indicate that one of the benefits of employing [LHWs] who are empathetic and knowledgeable about the culture, as well as possessing the relevant language skills, is a

> more effective exchange of health information and improved dialogue between client and [LHW].” (Smith and Randhawa, 2006)

As engagement with health services and health outcomes among those living in the most deprived areas is typically lower compared to the least deprived areas, this review supports findings that LHWs are useful for supporting ‘hard to reach’ groups (Lewin et al., 2010). LHWs can bridge the gap between community health services and those living within the most deprived areas (Mackenzie, 2006), particularly when the LHW is recruited from within the same community as the target population group (Eng et al., 1997).

Program Theory 3: Strategies of LHW support which address parental motivation triggers engagement with the intervention and parenting behaviour, while providing opportunities for person-centred support.

The provision of free resources related to the parenting behaviour removed financial barriers to engagement and increased parental motivation and engagement with the behaviour. If delivered on a pre-determined schedule, free resources also incentivised parents to accept ongoing LHW support.

> “…a voucher for hot drink/cake from department store [was given] in week 5 to initiate discussion on breastfeeding outside the home […] women participating in the intervention received a mean of 3.3 home visits compared to 0.9 before the incentive intervention. Similarly, the mean contact time with [LHWs] was considerably higher for the incentive intervention (225 minutes) compared to the [LHW] programme alone (145 minutes).” (Thomson et al., 2012a)

Parents' readiness to examine their own parenting behaviours, perception of self-efficacy, and readiness to accept or deny the need to change are recognised as factors which influence parental motivation to adopt positive parenting behaviours (Prochaska and DiClemente, 1984). This review found motivational counselling techniques were a successful way of identifying and increasing parents' motivation to engage with the health behaviour. Motivational interviewing gave LHWs an opportunity to discuss parents' attitudes to the behaviour while ensuring parents did not feel criticised for their choices. Consequently, parents who were *not* initially motivated to engage with the behaviour did not immediately reject the LHW or the intervention.

> "From discussions with [LHWs] it became apparent that they employed a form of motivational counselling to identify each mothers' beliefs around breastfeeding and so provided appropriate information. [LHWs] would ask each mother about her choice of feeding and why she had made that decision then move onto asking her what she knew about breastfeeding and her feelings about breastfeeding. By doing this [LHWs] could identify those who may have been receptive to further information and support, those who knew enough and had sufficient support, and those who appeared hostile to the subject." (McInnes and Stone, 2001)

Assessing parental motivational readiness to change can be a useful strategy for LHWs deciding how to engage with parents and provide opportunities for person-centred support. Other reviews show that motivational interviewing can improve health outcomes including oral health outcomes (Lundahl et al., 2013; Borrelli et al., 2015; Opoku et al., 2017).

Our findings illustrate that interventions which operate through self-referral are likely to attract parents already motivated to engage with the health behaviour (Trickey et al., 2018; Sridharan et al., 2008). Further, health professionals are less likely to refer parents with low motivation to a LHW intervention. These findings support studies which indicate that low parental motivational readiness to change can be a barrier to engagement with services (Nock and Photos, 2006). 'Proportionate universalism' (Marmot et al 2020) removed some of the perceived stigma associated with accessing LHW support. Despite this, LHW-delivered interventions were still only delivered to parents already motivated to engage with the health behaviour.

> "First, [the intervention] took an area-based approach to improving health within vulnerability defined geographically. This approach was taken to avoid stigmatising families." (Mackenzie, 2008)

Program Theory 4: Practical training and peer/mentor support activates LHW perception of value and confidence in the role, which safeguards retention of LHWs to the intervention.

Practical, participative training (i.e. role-play) increased LHWs' ability to support parents while also providing them with the skills to deliver the role. This, combined with regular training updates maintained LHW enthusiasm and confidence in the role and provided a smooth transition from training to delivery. A coordinator or mentor who was mindful of the LHWs' background, needs and skills reinforced LHWs sense of value and provided them with a 'safety net' of support; peer support among LHWs facilitated opportunities for shared learning. The importance of quality training and support for positive outcomes in LHW interventions has already been identified (Glenton et al., 2013; Suppiah, 2008).

> "…to maintain [an intervention] it is essential that [LHWs] are provided with ongoing support and encouragement. Without this, retention [of LHWs] becomes a major challenge." (Watt et al., 2006)

Combined, these strategies of LHW training and support helped to maintain enthusiasm and commitment to the role as well as retention of LHWs to the intervention.

Program Theory 5: LHW interventions which are embedded in communities as a result of stakeholder buy-in demonstrate stable models of delivery and ease the burden on existing health and community services.

Community outreach to wider stakeholder groups positively influenced stakeholder 'buy-in' to LHW interventions. Stakeholder buy-in was affected by the perception that LHWs were a complementary asset to the professionals' role rather than a threat or replacement service. This kind of endorsement arose when stakeholders had the opportunity to witness the long-term benefits of the LHW intervention (McInnes and Stone 2001).

> "The consultant obstetrician with a special remit for [town], acknowledged that a growing number of mothers were attempting to breastfeed and that the [LHW-delivered intervention] seemed to be beneficial…he invited the [LHWs] to provide peer support at his outreach antenatal clinic in the community health centre. This obstetrician later won the Obstetrician of the Year Award in 1996 for team working, an event which also featured the [LHWs]" (McInnes and Stone, 2001)

As others have found, when the LHW-stakeholder relationship worked well, LHWs reduced the burden on existing health and community services and were often more

successful in engaging with hard to reach populations (Glenton et al., 2013; Trickey et al., 2018). Thus LHW interventions could in effect, bridge the gap between hard to reach populations and health services (Mackenzie 2006; McInness and Stone 2001; Dugdill et al 2009). In contrast, if stakeholder/professional groups do not understand or value the LHW role, or view LHWs as a threat or burden, parents may receive mixed messages, or may not be referred to or engage with the intervention (Glenton et al., 2013; Suppiah, 2008; Trickey et al., 2018).

Strengths and limitations

This review drew on UK-based child health interventions delivered by LHWs to parents, an existing but small field of literature, and added to current knowledge about how, for whom and in what context such interventions can be successful. While this review explored LHW interventions sharing characteristics with Childsmile's DHSW role, it has also explicated program theory which can inform future development of LHWs interventions in certain contexts.

A key strength was the use of formal realist methodology. The realist rejection of traditional methodological hierarchies for systematic review enabled the inclusion of literature from a broad range of research paradigms: many of which may have been discounted in more traditional reviews (Pawson et al., 2004). In this way, the review further strengthens the existing evidence base surrounding LHW delivered interventions.

While it may be regarded as a limitation, this review's focus on UK-based interventions had clear benefits, in that learning was derived from the specific context of the UK health framework. As this review was a component study of the national Childsmile evaluation strategy and Childsmile operates partly within NHS structures,

any explicated findings had to consider NHS-related systems-level constraints which shape delivery.

A further strength of this review was the transparent, systematic and robust literature search process undertaken. Nonetheless there is potential that relevant interventions were missed due to poor reporting and/or lack of standardised terminology surrounding LHWs. Many of the studies in this review focused on breastfeeding which reflects current use of LHWs to improve child health in a UK context. Despite recent guidelines there is still a lack of detail in reporting interventions (Des Jarlais et al., 2004; Tong et al., 2007; Liberati et al., 2009; Moher et al., 2009; Schulz et al., 2010). As is standard protocol with a realist review, numerous sources were excluded due to poor descriptions of the intervention and outcomes. The need for improved and more consistent reporting of interventions has been noted elsewhere (Lewin et al., 2005; Lewin et al., 2010; Glenton et al., 2013; Hoffmann et al., 2014).

Recommendations for future research

LHWs are shown to be best suited to supporting ‘hard to reach’ groups (Lewin et al., 2010) however questions remain as to whether LHWs have the capacity and capability to support individuals who are not motivated to engage with the behaviour. Future effort should concentrate on testing the program theories from this review as potential influencers on parental engagement and adoption of positive parenting behaviours. Within Childsmile, future research should focus on refining program theory for the DHSW role and assessing the impact of the optimised role. It would be beneficial to channel effort toward a realist review informed assessment of whether a standardised model of DHSW delivery within areas of concentrated deprivation, as evidenced elsewhere in Scotland (Mackenzie, 2006), can achieve Childsmile outcomes.

Implications for Practice

LHWs represent an underused resource and on occasion would be the preferred form of health worker. The unique ‘layness’ and commonality of the LHW, and subsequent relationship with recipients, is a strength of their role. There is evidence for wider use of LHWs, particularly in supporting parents to engage with health-related parenting behaviours, and there is increasing evidence to suggest LHWs can reduce some of the demands on health service workers’ time and resources.

Conclusion

This realist review highlighted the components of LHW-delivered child health interventions, delivered to parents, which contribute to their effectiveness. Some of these characteristics differentiate LHW support from professional care, for example where LHWs commonality and shared experience with parents provides a crucial context for trust to develop, facilitating person-centred support. LHWs ability to triage parental motivation, the provision of practical training and peer support, and embedding LHW interventions within the community through positive engagement with stakeholders were found to be central to success. This review supports previous findings that LHWs can positively influence child health parenting behaviours and provides program theory to inform future development of LHW interventions in similar contexts. Within Childsmile, future effort should focus on refining program theory for the DHSW role. This should include testing whether further implementation of program theories from this review can aid Childsmile in delivering its intended outcomes.

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