Early intervention programs using volunteers for child development and nutrition: a mixed methods systematic review protocol

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Review question/objective: The overall aim of this mixed methods systematic review is to explore the effectiveness and experience of early intervention programs using volunteers, peer supporters and community champions with the aim of improving one or more of the following outcomes of children from conception to two years:

- Cognitive development
- Social and emotional development
- Speech and language
- Nutrition.

Specifically the review questions are:

- Are community-based interventions using non-paid volunteers(peers effective in improving cognitive, social and emotional development, speech, language and nutrition?
- What is the level of engagement (number of sessions attended, adherence) with such interventions in trial settings?
- What are the experiences of families/caregivers of engaging in such interventions?
- What are the reported changes in health and wellbeing of families/caregivers involved in these interventions?

Keywords Child development; intervention; mixed methods; nutrition

Background

Providing children with the best start in life has been a priority in many governments’ agendas over the past decade. Early intervention has been repeatedly recognized as the most appropriate way of ensuring that every child has the best chance of achieving their full potential.1,2 There is growing evidence to support the assertion that biological and psychosocial experiences in early life can affect brain development and behavior,3 suggesting that the most effective and cost-effective way to prevent health inequalities is to intervene early before behavior and health patterns have been firmly established.4 Therefore, interventions targeting early childhood may offer a unique opportunity to improve long-term health and psychosocial outcomes.

Although early intervention is a priority worldwide, this review will focus on early intervention programs that have been developed and tested in high-income countries (based on their human development index) to identify evidence that could be replicated in a UK context.5

Since 2010, UK government guidance has been calling for early intervention programs which target children’s development.6–8 Ensuring that children fulfill their developmental potential can improve school attainment, build resilience and improve wellbeing. A number of elements have been identified as risk factors regarding children’s development. Poor communication skills, inadequate cognitive stimulation and nutrient deficiencies resulting from poor nutrition have been found to be the main factors leading to poor child development.9 For this reason, many early intervention programs in the United Kingdom are now trying to address those factors by intervening as early as possible.10
Some literature suggests that early interventions targeting child development can be effective. Examples include early care and education programs in the United States, such as Head Start, Early Head Start and the Chicago Child-Parent Centers. These programs, which share common aspects, aim to improve language development by providing services and educational resources to parents and children. The services involved continuous intervention and assessment of child development (physical, cognitive and emotional), family support and counseling. Evaluation studies of these programs have demonstrated that children show significant improvements in language development following their participation in the programs. In addition, an early intervention program in Canada had positive effects on language and development for children, as well as improvements in parental wellbeing. The program included center-based early learning (preschool and kindergarten education), nutrition advice and strengthening of parental psychosocial resources.

However, there is some debate around the longer term effectiveness of early interventions. There is promising evidence to support the longer term effectiveness and cost-effectiveness of early interventions to prevent anti-social or delinquent behavior later in life. Nevertheless, with regards to children's development, the long-term effectiveness of early years interventions is still uncertain.

More recently, governments and local authorities have suggested that a community approach, mainly through the use of volunteers, should be incorporated in early intervention programs. By including volunteer members of the community in such programs, advocates have stated that this will improve relationships between early years services and the community, increase the levels of engagement with services, improve sustainability of universal services and allow for specialist staff to focus on families who need more targeted support. In fact, a study conducted in Nepal showed that volunteers were able to identify low birth weight of babies and provide advice and support to mothers to increase the baby’s weight. Moreover, studies on the use of peer supporters as part of maternal and neonatal care in India and Kenya have shown that it improves both community and self-resilience. However, the principal measured outcomes of these studies involved infant mortality and disease control and therefore may not be applicable to child development interventions of the type to be studied here. In addition to the benefits for the community, the use of volunteers can also be a valuable experience for the volunteers themselves as it increases their employability and improves self-confidence.

However, some have warned that the use of volunteers, despite the potential benefits, also comes with potential risks. The increased numbers of unqualified/untrained individuals could mean that mistakes in terms of service provision and support can be made.

There is a gap in terms of the evidence of the effectiveness of a community-based model applied in early intervention, particularly in early interventions targeting the outcomes of this review (cognitive, social and emotional development, speech and language and nutrition). In addition, the evidence base in terms of what works, for whom and when, is weak. Although systematic reviews in child development outcomes have been conducted, to our knowledge systematic reviews on the effectiveness of volunteers, peer supporters and community champions in improving those, have not. Previous systematic reviews have focused on improving maternal outcomes, such as mental health whereas others have only included studies from the United States or have focused on emotional and behavioral difficulties rather than other aspects of development. In addition they have used a quantitative approach. The proposed mixed methods review, appraising both the quantitative and qualitative evidence base, will fill this research gap by specifically assessing the effect of volunteers, peer supporters and community champions on all domains of child development (cognitive, social and emotional, speech and language) and growth/nutrition. It is expected that much of the evidence base regarding the effectiveness of volunteers in improving child development outcomes will be in the gray literature (i.e. evaluation reports from within voluntary organizations) and therefore would not have been picked up in other systematic reviews. Lastly, an initial scope of the literature by searching MEDLINE, the Cochrane Database of Systematic Reviews and the JBI Database of Systematic Reviews and Implementation Reports found no mixed methods systematic reviews that have answered the research question of this review.

However, there is evidence from qualitative systematic reviews that mothers involved in early years...
interventions prefer support from peers rather than health professionals.\textsuperscript{26,27} In addition, quantitative systematic reviews have shown that lay health professionals (members of the community) can improve a number of health-related outcomes for both mothers and children, such as breastfeeding and immunization uptake.\textsuperscript{28} Generally, most existing systematic reviews have focused on the use of volunteers and peer supporters in breastfeeding. However, there seems to be a lack of evidence on their effectiveness in improving child cognitive, social and emotional development and behavior outcomes. By synthesizing quantitative and qualitative evidence on the subject, questions around the feasibility, meaningfulness, appropriateness and effectiveness of utilizing volunteers in early intervention programs targeting child development will be answered and gaps in the evidence base identified.

The findings of this review will help to inform practice, make recommendations for future programs as well as guiding further research.

\textbf{Inclusion criteria}

\textbf{Types of participants}

The quantitative component of this review will consider studies that include community dwelling children from conception to two years old. Studies which focus primarily on children who have been diagnosed with a developmental condition as defined in the Diagnostic and Statistical Manual of Mental Disorders: Fifth Edition (DSM-V) or International Statistical Classification of Diseases and Related Health Problems (ICD-10) (e.g. intellectual disability, autism spectrum disorder, Down syndrome, language and learning disorder, cerebral palsy, vision impairment and hearing loss) will be excluded. However, we will include studies that have used a universal intervention where children with developmental disorders have not been specifically targeted.

The qualitative component of this review will consider studies that include parents of children who are two years old or younger. Studies which focus on parents of children with developmental disorders will be excluded.

\textbf{Types of intervention(s)/phenomena of interest}

The quantitative component of the review will consider studies that independently or dependently evaluate early interventions which have used volunteers, peer supporters and community champions who are not part of the health system and aim to improve cognitive, social and emotional development, speech, language and nutrition in children two years old or younger. Studies that have evaluated community-based interventions will be included (for the purposes of this review “community based interventions” will be defined geographically, to include interventions that have been implemented citywide or within community institutions such as neighborhoods, schools, churches, work sites, voluntary agencies or other organizations).

In addition, the focus of this review will be on early intervention programs that have been developed in high-income countries (based on the human development index). The human development index was chosen as an indicator because it takes into account not only the economic growth of a country but also life expectancy, education and standard of living. It is therefore a more inclusive indicator of the development of a country.\textsuperscript{29} The focus on high income countries was chosen to identify effective early years interventions that could be replicated in a United Kingdom context and therefore inform policy and practice in this country.

\textbf{Comparator}

The quantitative component of the review will consider studies that have compared the intervention in studies with children who have not received intervention (usual care). Studies that compare two community-based early interventions will also be included.

\textbf{Outcomes}

This review will consider studies that include validated outcome measures that relate to changes in cognitive, social and emotional development, speech, language and/or nutrition. Outcomes for development will include assessments using a validated developmental screening tool (e.g. Ages and Stages Questionnaires, Bayley Scales of Infant Development II, Social and Emotional Assessment/ Evaluation Measure). Outcomes for nutrition will include BMI scores and dietary intake. Outcomes can be measured or self-reported.

\textbf{Phenomena of interest}

The qualitative component of this review will explore the experiences of parents/caregivers who have participated in early intervention programs.
Context
The qualitative component of this review will explore a specific community context including, interventions delivered by non-paid volunteers, peer supports or community champions in a community setting.

Types of studies
The quantitative component of the review will consider both experimental and epidemiological study designs, including randomized controlled trials, non-randomized controlled trials, quasi-experimental, before and after studies, prospective and retrospective cohort studies, case control studies and analytical cross-sectional studies.

The qualitative component of the review will consider studies that focus on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research and feminist research.

Search strategy
The search strategy aims to find both published and unpublished studies. A three-step search strategy will be utilized in this review. An initial limited search of MEDLINE (PubMed) and CINAHL will be undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe article. The keywords that will be used are: new-born OR baby AND volunteers AND communication OR language OR cognitive development OR social development OR emotional development OR diet OR nutrition. A second search using all identified keywords and index terms will then be undertaken across all included databases (listed below separately for published and unpublished literature). Third, the reference list of all identified reports and articles will be searched for additional studies. Only studies published in English will be considered in this review. Studies published from 1980 onward will be included. This is the start period when relevant studies (e.g. the evaluations of the family–nurse partnership) started to be published and therefore was selected as the range for this review.

Following the initial search, the following databases will be searched:
ASSIA
CINAHL
MEDLINE (PubMed)

Social Care Online
ScienceDirect
Cochrane Register of trials
Database of Abstracts of Reviews of Effectiveness (DARE)
Child Development & Adolescent Studies
PsycINFO
Scopus
Sage Journals Online
The search for grey literature will include (1):
Best Evidence Encyclopedia: http://www.bestevidence.org/
Blueprints for Health Youth Development: http://www.blueprintsprograms.com
Centre for Excellence and Outcomes (C4EO): http://www.c4eo.org.uk/themes/general/localpracticeexamples.aspx?themeid=10
Collaborative for Academic, Social, and Emotional Learning (CASEL): http://casel.org/guide/
Centre for Analysis of Youth Transitions (CAYT): http://www.ifs.org.uk/centres/caytRepository
Coalition for Evidence-Based Policy: http://evidencebasedprograms.org/wordpress/
Databank of Effective Youth Interventions: www.nji.nl/euginterventies
European Alliance for Families: http://europa.eu/epic/practices-that-work/index_en.htm
Investing in Children: www.investinginchildren.eu
Joseph Rowntree Foundation: https://www.jrf.org.uk/?gclid=CKbZ5or8qcwCFUefGwOdbceAG9A
Netherlands Youth Institute: http://www.youthpolicy.nl/yp/Youth-Policy/Youth-Policy-subjects/Netherlands-Youth-Institute-Effective-youth-interventions
Partnership for Results (PRF): http://www.partnershipforresults.org/programs.html

Search terms will include: new-born OR baby OR child OR infant OR toddler AND volunteers OR peer supporters OR community champions AND communication OR language OR cognitive development OR social development OR emotional development OR diet OR nutrition. Each electronic database will be systematically searched using combinations of these search terms, tailored to the syntax and functionality of each database.

Assessment of methodological quality
Quantitative articles selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) (Appendix I). Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer.

Qualitative articles selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments from the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) (Appendix I). Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer.

Data extraction
Quantitative data will be extracted from articles included in the review using the standardized data extraction tool from JBI-MAStARI (Appendix II). The data extracted will include specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives.

Qualitative data will be extracted from articles included in the review using the standardized data extraction tool from JBI-QARI (Appendix II). The data extracted will include specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives.

Data synthesis
Evidence from randomized controlled trial data will, wherever possible, be pooled in statistical meta-analysis using the Joanna Briggs Institute Mixed Methods Assessment and Review Instrument (JBI-MMARI). All results will be subject to double data entry. Effect sizes expressed as odds ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed statistically using the standard \( \chi^2 \). Wherever statistical pooling is not possible, the findings will be presented in narrative form including tables and figures to aid in data presentation wherever appropriate.

Qualitative research findings will, wherever possible, be pooled using the JBI-MMARI. This will involve the aggregation or synthesis of findings to generate a set of statements that represent that aggregation, through assembling the findings rated according to their quality, and categorizing these findings on the basis of similarity in meaning. These categories are then subjected to a meta-synthesis to produce a single comprehensive set of synthesized findings that can be used as a basis for evidence-based practice. Wherever textual pooling is not possible, the findings will be presented in narrative form.

The findings of each single-method synthesis included in this review will be aggregated using the JBI-MMARI. This will involve the configuration of the findings to generate a set of statements that represent that aggregation through coding any quantitative to attribute a thematic description to all quantitative data. The resulting themes will be assembled from quantitative and qualitative syntheses; and configured to produce a set of synthesized findings in the form of a theoretical framework, set of recommendations or conclusions.

Acknowledgement
This review will be undertaken as part of a PhD degree.

References


Appendix I: Appraisal instruments

**MAStARI appraisal instrument**

**JBI Critical Appraisal Checklist for Randomised Control / Pseudo-randomised Trial**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Unclear</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was the assignment to treatment groups truly random?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>2. Were participants blinded to treatment allocation?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>3. Was allocation to treatment groups concealed from the allocator?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>4. Were the outcomes of people who withdrew described and included in the analysis?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>5. Were those assessing outcomes blind to the treatment allocation?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>6. Were the control and treatment groups comparable at entry?</td>
<td>☐</td>
<td>☐</td>
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<td>7. Were groups treated identically other than for the named interventions</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>8. Were outcomes measured in the same way for all groups?</td>
<td>☐</td>
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<td>9. Were outcomes measured in a reliable way?</td>
<td>☐</td>
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<td>10. Was appropriate statistical analysis used?</td>
<td>☐</td>
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</table>

Overall appraisal: Include ☐ Exclude ☐ Seek further info. ☐

Comments (Including reason for exclusion)  

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# JBI Critical Appraisal Checklist for Comparable Cohort/Case Control

<table>
<thead>
<tr>
<th>Question</th>
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<th>No</th>
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<th>Not Applicable</th>
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<tbody>
<tr>
<td>1. Is sample representative of patients in the population as a whole?</td>
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<td>2. Are the patients at a similar point in the course of their condition/illness?</td>
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<td>3. Has bias been minimised in relation to selection of cases and controls?</td>
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<td>4. Are confounding factors identified and strategies to deal with them stated?</td>
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<td>5. Are outcomes assessed using objective criteria?</td>
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<td>6. Was follow up carried out over a sufficient time period?</td>
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<tr>
<td>7. Were the outcomes of people who withdrew described and included in the analysis?</td>
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<tr>
<td>8. Were outcomes measured in a reliable way?</td>
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<tr>
<td>9. Was appropriate statistical analysis used?</td>
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**Overall appraisal:**

- Include [ ]
- Exclude [ ]
- Seek further info. [ ]

**Comments (Including reason for exclusion):**

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QARI appraisal instrument

**JBI QARI Critical Appraisal Checklist for Interpretive & Critical Research**

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<th>Date</th>
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<tbody>
<tr>
<td>Author</td>
<td>Year</td>
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| 1. Is there congruity between the stated philosophical perspective and the research methodology? | Yes | No | Unclear | Not Applicable |
| 2. Is there congruity between the research methodology and the research question or objectives? | Yes | No | Unclear | Not Applicable |
| 3. Is there congruity between the research methodology and the methods used to collect data? | Yes | No | Unclear | Not Applicable |
| 4. Is there congruity between the research methodology and the representation and analysis of data? | Yes | No | Unclear | Not Applicable |
| 5. Is there congruity between the research methodology and the interpretation of results? | Yes | No | Unclear | Not Applicable |
| 6. Is there a statement locating the researcher culturally or theoretically? | Yes | No | Unclear | Not Applicable |
| 7. Is the influence of the researcher on the research, and vice-versa, addressed? | Yes | No | Unclear | Not Applicable |
| 8. Are participants, and their voices, adequately represented? | Yes | No | Unclear | Not Applicable |
| 9. Is the research ethical according to current criteria or, for recent studies, is there evidence of ethical approval by an appropriate body? | Yes | No | Unclear | Not Applicable |
| 10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data? | Yes | No | Unclear | Not Applicable |

Overall appraisal: [ ] Include [ ] Exclude [ ] Seek further info.

Comments (including reason for exclusion)

________________________________________________________________________

________________________________________________________________________
Appendix II: Data extraction instruments

**MAStARI data extraction instrument**

**JBI Data Extraction Form for Experimental / Observational Studies**

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<td>Author</td>
<td>Year</td>
</tr>
<tr>
<td>Journal</td>
<td>Record Number</td>
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</table>

**Study Method**

- RCT
- Quasi-RCT
- Longitudinal
- Retrospective
- Observational
- Other

**Participants**

- Setting

**Population**

**Sample size**

- Group A
- Group B

**Interventions**

- Intervention A
- Intervention B

**Authors’ Conclusions**

**Reviewer’s Conclusions**
### Study results

#### Dichotomous data

<table>
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#### Continuous data

<table>
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QARI data extraction instrument

JBI QARI Data Extraction Form for Interpretive & Critical Research

Reviewer  Date

Author  Year

Journal  Record Number

Study Description
Methodology

Method

Phenomena of interest

Setting

Geographical

Cultural

Participants

Data analysis

Authors Conclusions

Comments

Complete  Yes □  No □
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<th>Findings</th>
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Extraction of findings complete: Yes ☐ No ☐