BMJ Open

Feasibility and acceptability of using the Alarm Distress BaBy (ADBB) scale within universal health visiting practice in England: a mixed-methods study protocol

Sharin Baldwin ,[1,2] Nafisa Insan ,[3] Hilda Beauchamp,[4] Vicky Gilroy,[1] Alison Morton,[5] Jane Barlow[6]

To cite: Baldwin S, Insan N, Beauchamp H, *et al*. Feasibility and acceptability of using the Alarm Distress BaBy (ADBB) scale within universal health visiting practice in England: a mixed-methods study protocol. *BMJ Open* 2023;**13**:e078579. doi:10.1136/bmjopen-2023-078579

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2023-078579).

Received 05 August 2023
Accepted 06 November 2023

For numbered affiliations see end of article.

Correspondence to
Dr Sharin Baldwin;
sharin.baldwin@ihv.org.uk

ABSTRACT

Introduction The Alarm Distress BaBy (ADBB) scale developed by Guedeney and Fermanian in 2001, is a validated screening tool designed for use by healthcare practitioners to identify infant social withdrawal. This study will explore the acceptability and feasibility of the use of the full ADBB scale and a modified ADBB (m-ADBB) scale as part of routine health visiting visits in England.

Methods and analysis A mixed methods sequential exploratory design will be used. Five health visitors will be trained in using the ADBB scale and 20 in the m-ADBB scale, from two National Health Service sites in England. Qualitative semi-structured interviews will be carried out with health visitors after they receive the training and again 2 months after using the scales in routine family health visits. Quantitative data will also be collected from the same participants for a range of items during the study period. The theoretical framework of Normalisation Process Theory will underpin the study, to provide in-depth explanations of the implementation process. Qualitative data will be analysed using thematic analysis. Quantitative data will be analysed using descriptive analysis.

Ethics and dissemination Ethical approval was granted by the University of Oxford Departmental Research Ethics Committee. Dissemination of results will be via organisational websites, social media platforms, newsletters, professional networks, conferences and journal articles.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ A mixed methods sequential exploratory approach will enable in-depth exploration of the use of the Alarm Distress BaBy (ADBB) and modified ADBB scale in England.
⇒ The qualitative methodology will allow consideration of the feasibility of implementing the scale into health visiting practice and its acceptability by health visitors.
⇒ The quantitative data will provide information on the key parameters relating to the implementation process.
⇒ Normalisation Process Theory will help explain the complex interactions and multiple competing demands involved in the implementation process.
⇒ As this is a small study involving health visitors from only two healthcare sites, the sample may not be considered entirely representative of all health visitors in England.

INTRODUCTION

It is now widely recognised that early social and emotional development is crucial for all areas of functioning across the lifespan.[1–3] The close and synchronous interactions between parent and infant helps the development of these socioemotional skills and the infant's ability to relate to the social world.[4] It is considered normal for infants to use withdrawal behaviours (such as looking away, closing eyes, sneezing) to control the pace of social engagement, even in a loving, responsive carer–infant relationship.[4 5] Sustained social relational withdrawal, however, may be an 'early alarm signal' for relational dyssynchrony and a coping mechanism that infants may employ to preserve energy in the context of frequent mismatched interaction with their primary caregiver.[6]

In some cases, excessive social withdrawal in infants may be indicative of atypical cognitive development, which is often seen in children with autistic spectrum disorders.[6] While the prevalence of autism spectrum condition is less than 2%,[7] research shows that excessive social withdrawal behaviours are seen in about 20% of children aged 1 year.[8] This is important because infants' early social disengagement has the potential to interfere with their capacity to interact with others appropriately, which could have a longer-term impact on their social and emotional development.[9] Studies have found that social

withdrawal at 1 year predicted emotional, behavioural and social difficulties in preschool children.[1] Early identification of sustained withdrawal in infants would enable health professionals to provide parents with appropriate support in terms of facilitating their child's long-term development and well-being, and is therefore key to enabling early intervention and optimising future child health outcomes.

Infancy provides a key window of opportunity to promote optimal parent–infant interaction and to identify interactional problems. This is also highlighted in the national vision for England, 'The Best Start for Life' which focuses on the first 1001 critical days to improve health outcomes of all babies.[10] Additionally, the new national 'Healthy Child Programme Schedule of Interventions Guide' published in 2023 states that where there are concerns about early relationships and infant mental health and well-being, an assessment should be completed to identify family needs and strengths. There is, however, no information provided with regard to which tools to use, thereby emphasising the need for a validated tool that is acceptable and feasible for use in England.[11]

A range of parent-reported outcome measures and clinician-rated outcome measures, have been developed over the past two decades to assess parent–infant relationships.[12] Most of these however, have significant limitations in terms of their use within a clinical setting and they were not designed for use by clinicians such as health visitors as part of their routine care of families in the postnatal period. Furthermore, while 'supporting child health, wellbeing and development' is one of the six 'High Impact Areas' for health visiting in England, there is wide variation in the approaches used and support offered to families. The national commissioning guidance for health visiting does not recommend the use of any specific tool for identifying possible parent–infant relationship problems, and this is left to local decision-making.[13] While practitioners in some areas use assessment tools to support their clinical decision-making, only one of these was designed specifically for health visitors' universal assessment of parent–infant relationships (ie, the Parent Infant Interaction Observation Scale (PIIOS), but this involves the need to videotape the interaction.[14]

Assessing the parent–infant relationship is complex, and the Alarm Distress Baby (ADBB) Scale, developed by Guedeney and Fermanian in 2001,[15] is a well-validated tool designed to identify infant social withdrawal by healthcare practitioners.[16 17] It can enable practitioners to focus on identifying signs of distress in the infant based on naturalistic engagement. Specifically, the ADBB approach is designed to facilitate the observation of the infant's behavioural reactions when the clinician engages the infant in social interactions through talking, touching and smiling.

The scale comprises eight items: (1) facial expression, (2) eye contact, (3) general level of activity, (4) self-stimulating gestures, (5) vocalisations, (6) rapidity of response to stimulation, (7) ability to initiate/maintain relationship and (8) ability to generate/sustain attention.[15 16] It is used for infants aged 0–24 months and each item is rated from 0 to 4 with the overall score reflecting an interpretation of the baby's behaviour in a given situation. A score of 5 or above is indicative of relational withdrawal.[15] While signs of excessive withdrawal from social interaction may not always indicate the presence of problems, it should nevertheless alert the clinician to the need for further assessment of both the infant and the caregiving environment.[15] Furthermore, the skills gained from the ADBB approach could enhance practitioner observation and assessment of infants.

Validity and reliability studies of the ADBB scale from different countries, populations and settings have shown good results.[6 16–20] The scale has good criterion validity as a measure of the infant's withdrawal reaction, with a very good correlation between nurse and paediatrician on the ADBB (rs=0.84), and as a screening procedure for detecting the developmental risk of the infant.[15] The cut-off score of 5 with a sensitivity of 0.82 and a specificity of 0.78 was determined to be optimal for screening purposes.[15] The ADBB has a global Cronbach α of 0.83 suggesting good internal consistency.[15] A recent Nepalese study showed that the scale was applicable to Asian infants and the findings suggested that the ADBB is an acceptable approach to achieve adequate inter-rater agreement in a large community based study in Nepal.[20] Similar results were found in studies conducted in France,[18] South Africa[19] and Democratic Republic of the Congo.[21] However, while there is strong evidence to suggest the transcultural validity of the ADBB, it is yet to be studied in an English context.

Smith-Nielsen and colleagues examined the feasibility and acceptability of implementing universal screening for infant socioemotional problems using the ADBB in the practice of health visitors in three (of five) districts of Copenhagen, Denmark.[17] This study was part of an initiative developed by the Copenhagen Infant Mental Health Project (CIMHP). The study found that screening prevalence rates had increased with 79% of children seen by the health visitors on their routine home visits being screened for social withdrawal using the ADBB. Most (92%) of the health visitors reported that the instrument made a positive contribution to their work which predicted screening prevalence rates. As a result of these findings, the CIMHP translated the research knowledge into a training programme for health visitors to enable them to be certified in the use of ADBB as part of routine examinations of the infant during home visits.[17]

Following the initial pilot study by Matthey *et al*,[22] of the use of the ADBB in an Australian context, a modified version of the ADBB was developed by revising the scoring method of the ADBB to better fit the Australian context and also to remove items that were either very difficult on which to obtain sufficient inter-rater agreement or were highly correlated with other items, suggesting that they were measuring similar behaviours. This revision is known as the m-ADBB (modified ADBB).[23] The five-item

m-ADBB is a clinically useful behavioural checklist that may suggest withdrawal in infants. The m-ADBB may be more appropriate for use by health visitors in England as it has fewer items and a simpler scoring system which improves inter-rater reliability. The m-ADBB could potentially provide health visitors and other practitioners with additional skills that could be used to develop a fuller picture of early interactional environments, in which further assessments or intervention is necessary.

AIMS AND OBJECTIVES

The aim of this study is to explore the acceptability and feasibility of using the ADBB and m-ADBB scale to identify infant social withdrawal as part of routine 6–8 week visits carried out by health visitors. This study will provide further insight into whether these scales can be used as tools to support and enhance practice within health visiting services in England.

Research questions

1. How acceptable and feasible are the ADBB and m-ADBB training programmes?
2. How acceptable and feasible is the use of the ADBB and m-ADBB scale as part of routine care within the health visiting provision in England?
3. What are the facilitators and barriers affecting the implementation of the ADBB and m-ADBB scale in health visiting practice?

METHODS AND ANALYSIS

Study design

A mixed methods sequential exploratory design will be used as this method was considered to be the 'best fit' to answer the research questions. The aim of this study is to explore the feasibility of using the ADBB and m-ADBB scale in health visiting practice and acceptability of the scales by health visitors. This cannot be achieved without incorporating qualitative data from exploring the health visitors' views, with quantitative data from participant recruitment, training, scale implementation, identification of concerns and follow-up rates.

Five health visitors will be trained in using the full ADBB scale and 20 health visitors in the m-ADBB scale. Semi-structured interviews will be carried out with health visitors after they have completed the training and again 2 months after using the scale in routine 6–8 week visits. Quantitative data will also be collected from the same participants for a range of items during the study period using a standardised data collection template.

Study setting and participants

Data will be collected from health visitors in two National Health Service sites, one in Central England and the other in Northern England. Five health visitors trained in using the full ADBB scale and 20 in the m-ADBB scale will be recruited across the sites. In addition, 2–4 managers/clinical leads from both sites will be recruited.

Purposive sampling will be used. Managers from each site will identify health visitors who have been trained in either the ADBB or the m-ADBB scale and share their contact details with the research team, with the health visitors' consent. All potential participants will then be contacted by the research team and provided with the participant information sheet detailing the nature and objectives of the study, data collection procedures, possible risks and benefits, data security and management. All potential participants will also be given a point of contact if they have any queries or questions regarding the study. Written informed consent will be obtained prior to the interviews.

Inclusion criteria

- Health visitors (including specialist health visitors) who have completed the ADBB and/or m-ADBB training
- Managers and clinical leads from the two study sites with responsibility for the health visiting service.

Exclusion criteria

- Health visitors who do not complete the ADBB/m–ADBB training or those on long-term leave during the data collection period will be excluded due to the tight timescales of the project.

Patient and public involvement

This study protocol has been reviewed and approved by the study sponsor. Co-design involved the use of a workshop with health visitors to inform the development of the study, including consideration of the data collection methods and analysis.

Theoretical framework

This study will use the explanatory model of implementation theory provided by Normalisation Process Theory (NPT).[24–26] NPT was selected as an appropriate implementation theory for its use within the health visiting context as it addresses the reality of healthcare provision within highly contextualised organisational environments, often operationalised under pressure, involving complex interactions and multiple competing demands.[27]

NPT focuses on four key constructs of:

1. Coherence: sense-making.
2. Cognitive participation: the relational process of enrolment in a new practice.
3. Collective action: the enactment of the new skills provided by the ADBB and m-ADBB training.
4. Reflexive monitoring: appraisal and perceived potential impacts.[27]

Data collection and analysis

Qualitative data will be collected through semi-structured interviews using flexible topic guides (online supplemental appendix A and online supplemental appendix B). These guides have developed based on the NPT constructs to ensure a thorough exploration of all aspects of the implementation process. Open questions

with prompts will be used as the responses are largely unknown and their use will enable participants to express their own views, reasons and explanations. All 25 participants (5 health visitors trained in the full ADBB scale and 20 in the m-ADBB scale) will be invited to take part in two interviews each—one after they complete training and one 2 months after using the scale in practice. In addition to this, up to four managers/clinical leads will be interviewed 2 months following the implementation of the scale in practice, also using a topic guide (online supplemental appendix C). Each interview is likely to last between 45–60 min and will be recorded via Microsoft Teams/Zoom recording system. Only audio files of the interviews will be stored, and the interviews will be transcribed by The Transcription Company UK.

Interview data will be analysed using the six phases of thematic analysis as outlined by Braun and Clarke: (1) familiarisation with the data, (2) generation of initial codes, (3) search for themes, (4) review of themes, (5) defining and naming themes and (6) production of the report.[28]

Quantitative data will be collected from the same 25 participants on a range of items over 4 months during the study period, using a standardised data collection template (online supplemental appendix D). This will include the number of:

- Babies eligible for a 6–8 week postnatal assessment.
- 6–8 week contacts where the m-ADBB was used.
- Babies for whom withdrawal concerns were identified.
- Babies offered additional support.

Descriptive analysis will be undertaken of the quantitative data to explore the number and nature of the referrals relative to usual practice. The quantitative phase of data collection and analysis will follow the qualitative phase of data collection and analysis.

ETHICAL CONSIDERATIONS

The study will be conducted in compliance with the Health Research Authority Policy Framework for Health and Social Care Research and Good Clinical Practice.[29] All potential participants will be provided with a participant information sheet detailing the nature and objectives of the study and written informed consent will be obtained. All interviews will be carried out on a voluntary basis and participants will be informed that they can withdraw from the study at any stage. The anonymised interviews will be transcribed by a company with whom a confidentiality agreement has been put in place. Quotations from participants to illustrate identified themes will be anonymised to protect their identity.

A project advisory group has been formed to guide and challenge as needed to ensure the study adheres to the agreed protocol including the stated ethical terms.

Ethical approval has been obtained by the Departmental Research Ethics Committee (DREC) at the University of Oxford.

IMPACT AND DISSEMINATION

Use of ADBB and m-ADBB scale in routine health visiting practice has the potential to provide health visitors with additional skills and knowledge that could be used to develop a fuller picture of early interactional environments, where further assessment or intervention is necessary. Early intervention and support can contribute to achieving better long-term outcomes for children and families in line with the national priorities in England.

This study will provide vital information about the feasibility of using the standardised ADBB and m-ADBB scale in routine health visiting practice in England to support the early identification of infants showing signs of social withdrawal, as an indicator of possible parent–infant relationship concerns. It will inform whether the scale is acceptable to health visitors and what the potential barriers and facilitators to implementation are. Findings from this study could be used to design a wider-scale evaluation of the use of the ADBB and m-ADBB scale across all health visiting services in England. A study exploring sensitivity and specificity of the ADBB scale in the English context may be useful prior to this.

On completion, a final study report will be produced and made available on the Institute of Health Visiting (iHV) and The Royal Foundation Centre for Early Childhood website. Participants will be sent a brief user-friendly version of the final study report. Articles will be prepared for publication in peer-reviewed journals and dissemination will take place through the iHV social media, newsletters, professional networks, conferences and insight events reaching a wide range of parents and practitioners.

Author affiliations
[1]Research Department, Institute of Health Visiting, London, UK
[2]School of Nursing and Midwifery, Western Sydney University, Penrith, Western Australia, Australia
[3]Newcastle University, Newcastle upon Tyne, UK
[4]Perinatal Mental Health Team, Institute of Health Visiting, London, UK
[5]CEO, Institute of Health Visiting, London, UK
[6]Department of Social Policy, University of Oxford, Oxford, UK

Acknowledgements We would like to thank The Royal Foundation of The Prince and Princess of Wales for their grant that is enabling this study to be undertaken. We are also grateful for the advisory group members for sharing their expertise and guiding this study.

Collaborators This study protocol has been reviewed and approved by the study sponsor. Co-design involved the use of a workshop with health visitors to inform the development of the study, including consideration of the data collection methods and analysis. A project advisory group has been formed to guide and challenge as needed to ensure the study adheres to the agreed protocol including the stated ethical terms.

Contributors The original protocol was written by NI with support from HB and VG. It was reviewed by AM and JB, who provided critical feedback on the overall draft. SB reviewed, updated and submitted the protocol for publication. Following peer review, SB made substantial amendments in accordance with the feedback received. The conduct of the study will be led by SB with oversight from JB, VG and AM. All authors provided input into this protocol and approved the final manuscript.

Funding This work was supported by a grant from The Royal Foundation of The Prince and Princess of Wales.

Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iDs
Sharin Baldwin http://orcid.org/0000-0002-2374-5844
Nafisa Insan http://orcid.org/0000-0002-8483-7486

REFERENCES

1 Guedeney A, Pingault J-B, Thorr A, *et al*. Social withdrawal at 1 year is associated with emotional and behavioural problems at 3 and 5 years: the Eden mother-child cohort study. *Eur Child Adolesc Psychiatry* 2014;23:1181–8.
2 Buss KA, Schumacher JRM, Dolski I, *et al*. Right frontal brain activity, Cortisol, and withdrawal behavior in 6-month-old infants. *Behav Neurosci* 2003;117:11–20.
3 Feldman R. Parent–infant synchrony and the construction of shared timing: physiological precursors, developmental outcomes, and risk conditions. *J Child Psychol Psychiatry* 2007;48:329–54.
4 Brazelton TB, Koslowski B. Main M origins of reciprocity. In: Lewis M, Rosenblum L, eds. *Mother–infant interaction*. New York: Wiley, 1974: 57–70.
5 Greenspan S, Wieder S. Regulatory disorders. In: Zeanah CH, ed. *Handbook of infant mental health*. New York: Guilford Press, 1993: 280–90.
6 Guedeney A, Matthey S, Puura K. Social withdrawal behavior in infancy: a history of the concept and a review of published studies using the alarm distress baby scale. *Infant Ment Health J* 2013;34:516–31. 10.1002/imhj.21412 Available: http://doi.wiley.com/10.1002/imhj.2013.34.issue-6
7 Committee to Evaluate the Supplemental Security Income Disability Program for Children with Mental Disorders, Board on the Health of Select Populations, Board on Children, Youth, and Families. *Mental Disorders and Disabilities Among Low-Income Children*. Washington, D.C: National Academies Press (US), 2015.
8 Guedeney A, Forhan A, Larroque B, *et al*. Social withdrawal behaviour at one year of age is associated with delays in reaching language milestones in the EDEN mother– child cohort study. *PLoS One* 2016;11:e0158426.
9 Guedeney A, Doukhan S, Forhan A, *et al*. To which extent social withdrawal at the age of 1 year is associated with IQ at 5-6 years old? Results of the EDEN mother-child cohort. *Eur Child Adolesc Psychiatry* 2017;26:1343–50.
10 Department of Health and Social Care. The best start for life: a vision for the 1,001 critical days. the early years healthy development review report; 2021. Available: https://www.gov.uk/government/publications/the-best-start-for-life-a-vision-for-the-1001-critical-days
11 Healthy Child Programme Schedule of Interventions Guide. Office for health improvement and disparities. 2023. Available: https://www.e-lfh.org.uk/pathways-healthy-child/birth-to-6-months/universal.html
12 Royal College of Psychiatrists. FROM-perinatal framework for routine outcome measures in perinatal psychiatry. college report Cr216. 2018. Available: https://www.gov.uk/government/publications/commissioning-of-public-health-services-for-children/health-visiting-and-school-nursing-service-delivery-model
13 Public Health England. Health visiting and school nursing service delivery model. 2021. Available: https://www.gov.uk/government/publications/commissioning-of-public-health-services-for-children/health-visiting-and-school-nursing-service-delivery-model
14 Svanberg PO, Barlow J, Tigbe W. The parent–infant interaction observation scale: reliability and validity of a screening tool. J Reprod Infant Psychol 2013;31:5–14.
15 Guedeney A, Fermanian J. A validity and reliability study of assessment and screening for sustained withdrawal reaction in infancy the alarm distress baby scale (ADBB). *Infant Ment Health J* 2001;22:559–75. 10.1002/imhj.1018 Available: http://doi.wiley.com/10.1002/imhj.v22:5
16 Puura K, Mäntymaa M, Luoma I, *et al*. Infants' social withdrawal symptoms assessed with a direct infant observation method in primary health care. *Infant Behav Dev* 2010;33:579–88.
17 Smith-Nielsen J, Lønfeldt N, Guedeney A, *et al*. Implementation of the alarm distress baby scale as a universal screening instrument in primary care: feasibility, acceptability, and predictors of professionals' adherence to guidelines. *Int J Nurs Stud* 2018;79:104–13.
18 Guedeney A, Marchand-Martin L, Cote SJ, *et al*. Perinatal risk factors and social withdrawal behaviour. *Eur Child Adolesc Psychiatry* 2012;21:185–91.
19 Hartley C, Pretorius K, Mohamed A, *et al*. Maternal postpartum depression and infant social withdrawal among human immunodeficiency virus (HIV) positive mother-infant Dyads. *Psychol Health Med* 2010;15:278–87.
20 Ulak M, Ranjitkar S, Shrestha M, *et al*. The feasibility of the full and modified versions of the alarm distress baby scale (ADBB) and the prevalence of social withdrawal in infants in Nepal. *Front Psychol* 2020;11:2025.
21 Okitundu-Luwa D, Imbula Essam B, Sombo Ayanne MT, *et al*. “Sustained social withdrawal behavior and 'difficult' temperament among infants, in relation to maternal Affectivity in a low-income area of Kinshasa, democratic Republic of Congo”. *Eur Child Adolesc Psychiatry* 2023;32:427–37.
22 Matthey S, Guedeney A, Starakis N, *et al*. Assessing the social behavior of infants: use of the ADBB scale and relationship to mother's mood. *Infant Ment Health J* 2005;26:442–58. 10.1002/imhj.20061 Available: https://doi.org/10.1002/imhj.20061
23 Matthey S, Črnčec R, Hales A, *et al*. A description of the modified alarm distress baby scale (M-ADBB): an instrument to assess for infant social withdrawal. *Infant Ment Health J* 2013;34:602–9. 10.1002/imhj.21407 Available: http://doi.wiley.com/10.1002/imhj.2013.34.issue-6
24 May C, Finch T. Implementing, Embedding, and integrating practices: an outline of normalization process theory. *Sociology* 2009;43:535–54.
25 May C. Towards a general theory of implementation. *Implement Sci* 2013;8:18.
26 May CR, Johnson M, Finch T. Implementation, context and complexity. *Implement Sci* 2016;11:141.
27 May CR, Albers B, Bracher M, *et al*. Translational framework for implementation evaluation and research: a normalisation process theory coding manual for qualitative research and instrument development. *Implement Sci* 2022;17:19.
28 Braun V, Clarke V. *Thematic Analysis: A Practical Guide*. London: SAGE Publications Ltd, 2021.
29 Health Research Authority. UK policy framework for health and social care research. 2023. Available: https://www.hra.nhs.uk/planning-and-improving-research/policies-standards-legislation/uk-policy-framework-health-social-care-research/uk-policy-framework-health-and-social-care-research/