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## Introduction

- Hearing aid use is at its lowest and most variable in children under 3 years of age.
- Evidence suggests families face considerable challenges achieving consistent hearing aid use during this time.
- Although the implications for spoken language development are recognised, evidence-based strategies to overcome challenges are lacking.

### What are we doing?

- The Cherub project aims to target this gap by co-developing an intervention with parents, Audiologists, and ToDs, grounded in the principles of behaviour change theory.
- Behaviour change theories provide a way to identify and target all the areas that might influence a person's behaviour.
- This approach limits the risk of targeting only a subset of behaviour determinants, increasing the likelihood of intervention effectiveness and uptake.

### First step to intervention development

- Currently, there is no theoretically informed, comprehensive understanding of the determinants of hearing aid use with children under 3 years of age.
- We aimed to develop this understanding utilising the Theoretical Domains Framework [1; TDF].
- The TDF is an integrative framework that can be used to comprehensively and systematically identify the determinants of behaviour that intervention needs to target to bring about the desired change (i.e., what needs to change at the individual, social and/or environmental level to increase infant/toddler hearing aid use).

## Method

- Triangulating findings from multiple participant sources using different methodologies provides a stronger understanding and more accurate picture.
- We therefore conducted 3 studies to investigate barriers and facilitators to hearing aid use with 0–3-year-olds.
- Barriers and facilitators were mapped to the TDF to identify the determinants of consistent hearing aid use at this age.

### Systematic review

- 24 studies reporting barriers/facilitators to hearing aid use in 0–3-year-olds identified.
- Barriers/facilitators extracted & mapped to the TDF.

### Survey study

- Based on a validated TDF survey.
- Refined using feedback from parents, ToDs, Audiologists.
- 56 parents (average child age = 18mo).

### Interviews study

- 14 parents (average child age = 18mo), 8 ToDs, 6 Auds, 3 Ed Auds.
- Transcripts inductively coded for barriers/facilitators, which were mapped to the TDF.

## Key findings

- Barriers and facilitators are wide ranging and fall within all 14 domains of the TDF to some degree.
- Barriers are complex, dynamic, interconnected, and change over time.
- The more strongly several TDF domains reported, the lower child hearing aid use.
- Systematic review highlights how research lacking a theory-informed approach to understanding challenges faced by families, risks overrepresenting some domains and limiting investigations into other domains. Subsequently, limiting the evidence-base for intervention development.

### Environmental context & resources

- Hearing aid retention challenges.
- Child state/temperament.
- Collaboration across professionals.
- Relationship/trust with professionals.

### Knowledge

- Degree of knowledge about hearing loss, implications, role/benefits of hearing aids.
- Lack of/acceptance of hearing loss & belief in the diagnosis.
- Lack of/awareness of hearing aid retention devices.

### Emotion

- Fear/worry of child choking on/swallowing hearing aid parts.
- Experiencing difficult emotions using hearing aids (e.g., impact on bonding, stress, overwhelmed).

### Social influences

- Reactions, awareness, perceptions of strangers.
- Extended family acceptance.
- Cultural beliefs of extended family/community.
- Peer support.

### Beliefs about capabilities

- Perceived ability to use hearing aids consistently.
- Belief consistent hearing aid use is very difficult.

### Reinforcement

- Not observing any impact of hearing aids on child responses/outcomes.
- Observing child respond to sound without hearing aids (mild/moderate loss specific).

### Beliefs about consequences

- Belief/lack of belief in the benefits of hearing aids.
- Belief child does not need hearing aids.

### Behavioural regulation

- Establishing/challenges establishing & maintaining a routine.

### Skills

- Struggling to manage child behaviour in relation to hearing aid removal.
- Strategies to manage child behaviour in relation to hearing aid removal.

## Discussion

- Challenges to hearing aid use with babies and toddlers are considerable and complex.
- A wide range of behavioural determinants – wider than existing research currently suggests – needs to be targeted in intervention design to tackle these challenges.
- An intervention that utilises a TDF based screening tool to assess the domains that are most prominent at a given time, where intervention strategies designed to specifically target those domains (based on behaviour change theory) can then be tailored to a specific family may be highly beneficial.
- We are currently co-developing such an intervention with parents, Audiologists, and ToDs through a series of workshops.

## References

[1] Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implement Sci.* 2012 Apr 24;7(1):37.

## Acknowledgments

This research was funded by the NDCS and the MRC, and supported by the NIHR Manchester Biomedical Research Centre.

Interested in getting involved in CHERUB?

