Sensory and Developmental Screening and Monitoring Using mHealth Technologies: Improving Access to Care

ISEI Conference
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Contributors

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The context

95% of sensory impairments from LMICs

15 million children: hearing loss
25 million: vision

250 million children developmental delay

25% also developmental delay

Late identification: formal schooling

Dual-sensory challenges

Risks

What risks do the families you work with face?

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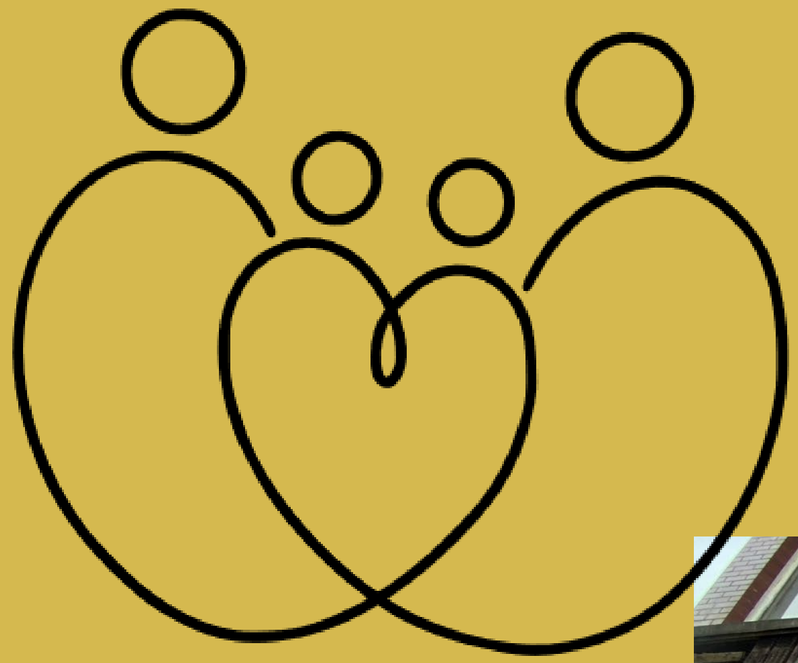

Resilience

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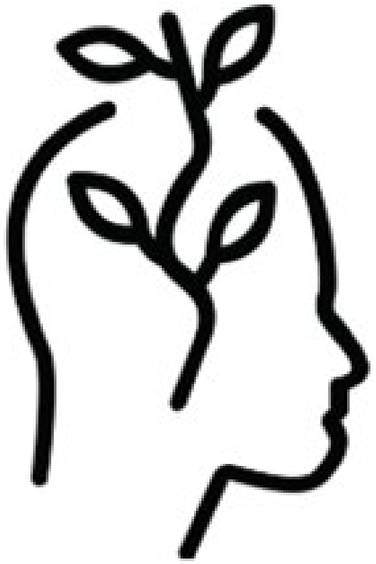
ECD CENTRES



What factors contribute to resilience in your communities?

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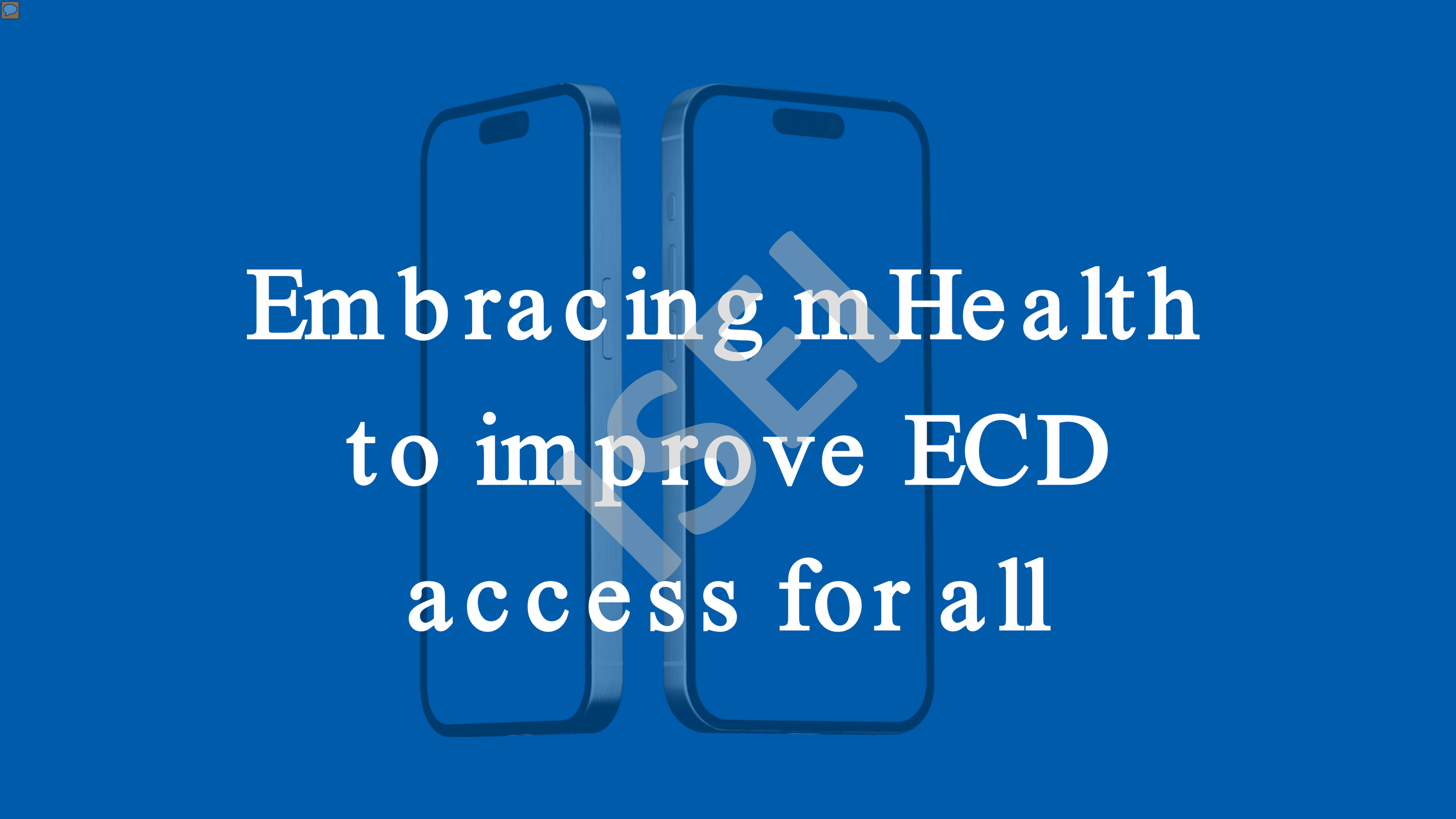

Embracing mHealth
to improve ECD
access for all


PEDStest

Combined screening approaches

Access to Care

- Detection
- Diagnosis
- Intervention

Healthy hearing for all children prior to school entry

What is the hearScreen?

HearScreen

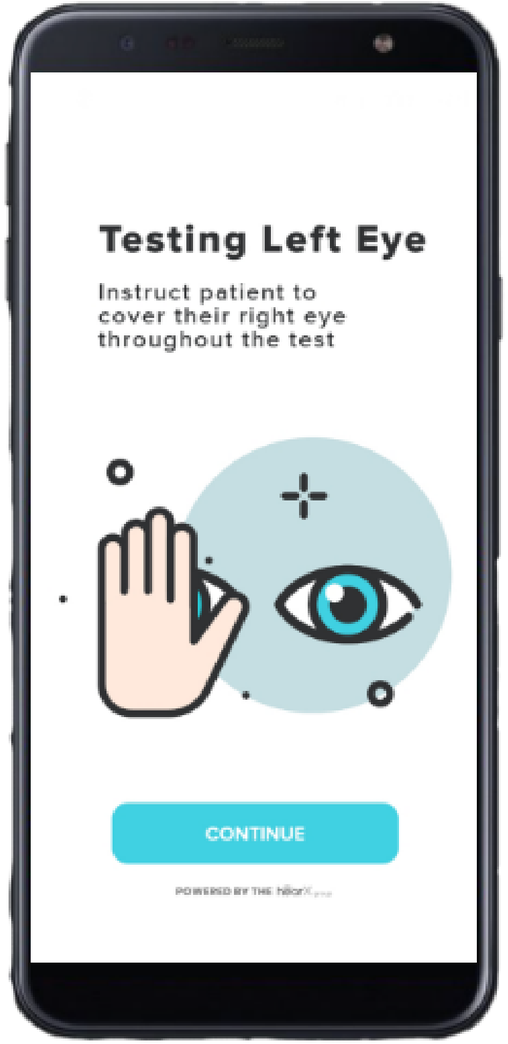
- mHealth, HearX product
- Android compatible
- Custom software with calibrated supra-aural Sennheiser HD280 Pro2 circumaural

Detection

- Screening tool: detection and surveillance
- Children: 4 years and older
- Hearing screening protocols - inline with WHO guidelines: pass/fail, 3 freq

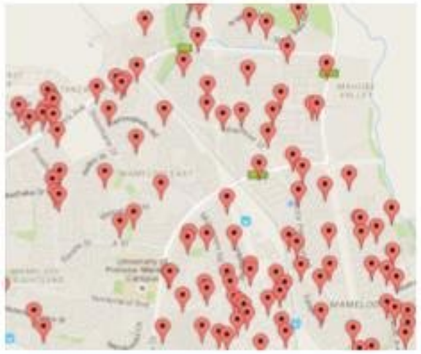
What is the Vula Vision?

- Smartphone based screening
- Protocol follows diabetic Retinopathy Study chart design
- logMAR charts



METHOD

ECD mapping → ECD screening → PHC triage, diagnosis, treatment

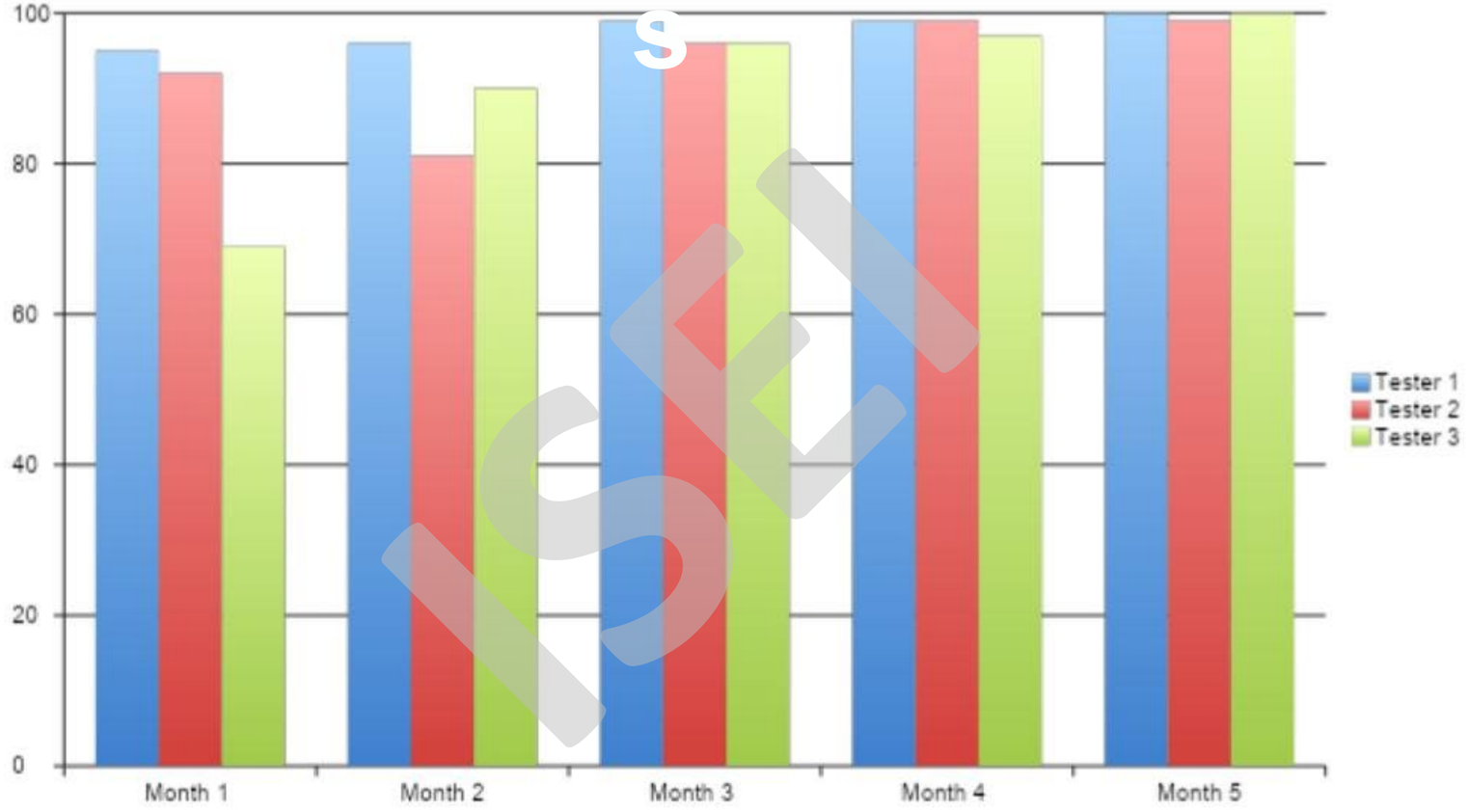


Data capturing, monitoring, surveillance, referral, reporting, directing care, tracking

Results

	Participants (n)	Referral Rate (%)
Gender		
Female	3446	26.9
Male	2978	22.7
Age groups		
3 years	504	45.8
4 years	1519	30
5 years	2259	22
6 years	2142	19.6

Result



Quality index of test operators over a 5 month period

What is the mHealth PEDSTools-SA?

Detection

- Screening tool: detection and surveillance
- Children birth through 6y 11m
- Developmental domains

Developmental literacy

- Awareness of milestones
- Knowledge of attainment
- Stimulation guidelines
- Knowledge sharing

What mHealth Tools are you currently using to support service delivery, if any?

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ECD

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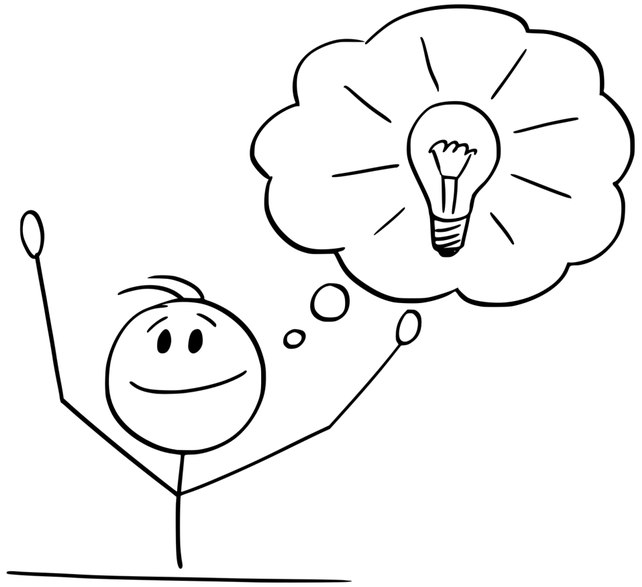
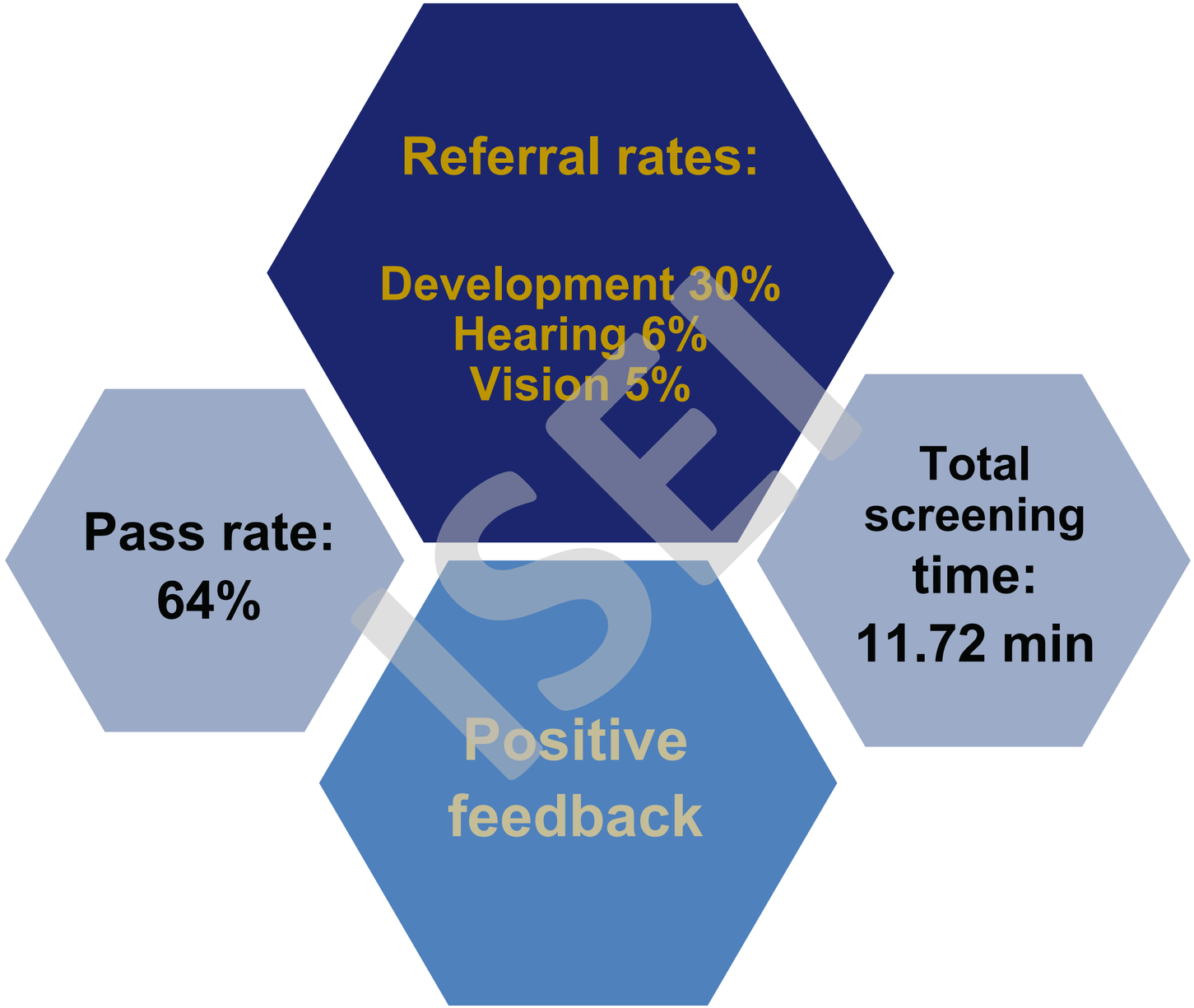
Solution-based approach



Combined sensory and developmental screening



What did the ECD practitioners and CHWs say about the tools and screening duration?

(Fuchs et al., 2023)

TABLE 4: COMPARISON BETWEEN SENSORY AND DEVELOPMENTAL SCREENING RESULTS (N=132)

mHealth PEDS tools - SA DEVELOPMENTAL DOMAINS	HEARING		VISION	
	p-value	*Correlation coefficient*	*p-value*	*Correlation coefficient*
RECEPTIVE LANGUAGE Pass n= 55 (41,7%) ; Fail n=77 (58,3%)	0,297	0,091	0,339	0,084
EXPRESSIVE LANGUAGE Pass n=40 (30,3%) ; Fail n=92 (69,7%)	0,449	0,067	**0,043***	**0,176***
FINE MOTOR Pass n=63 (47,7%) ; Fail n=69 (52,3%)	0,345	0,083	**0,044***	**0,176***
GROSS MOTOR Pass n=124 (93,9%) ; Fail n=8 (6,1%)	0,859	0,016	0,382	0,077
SOCIO-EMOTIONAL Pass n=110 (83,3%) ; Fail n=22 (16,7%)	**0,043***	**0,176***	0,913	-0,010
SELF-HELP SKILLS Pass n=102(77,3%) ; Fail n=30 (22,7%)	**0,010***	**0,224***	0,323	0,087
OVERALL OUTCOME Pass n=163 (47,7%) ; Fail n=69 (52,3%)	0,037*	0,181	**0,002***	**0,262***

IMPROVED COMBINED SCREENING PROCEDURES

(Wannenburg, 2024)

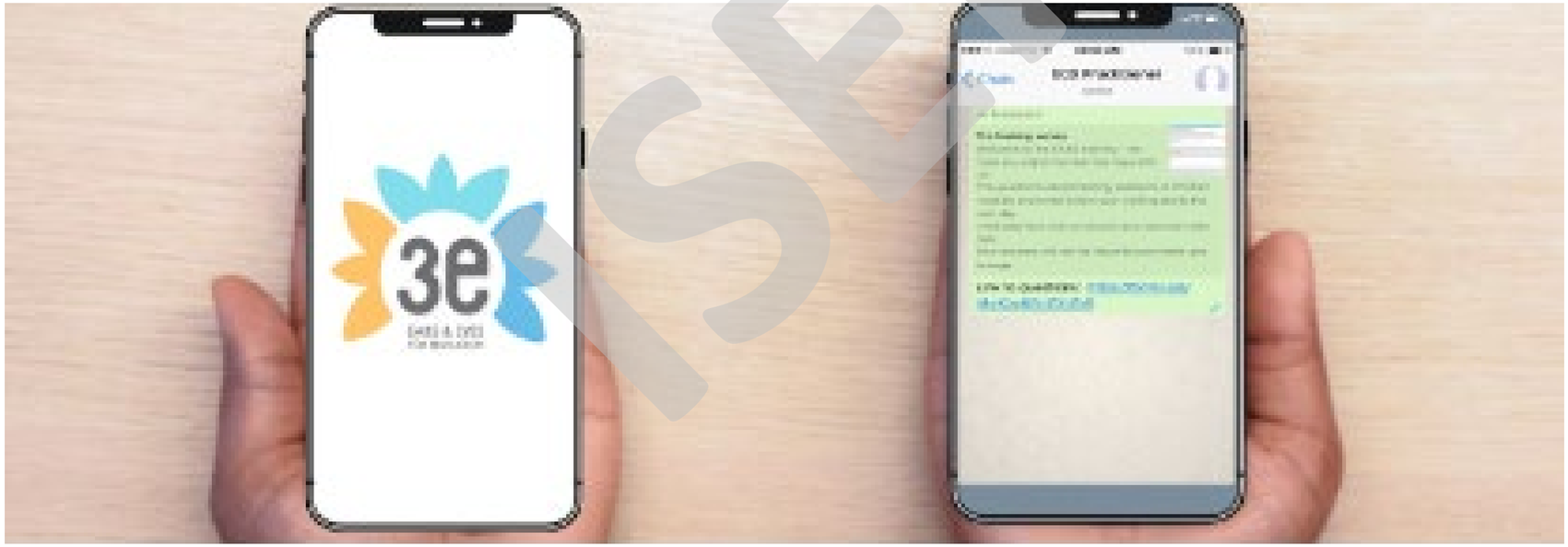
Identification: Combined screening programmes

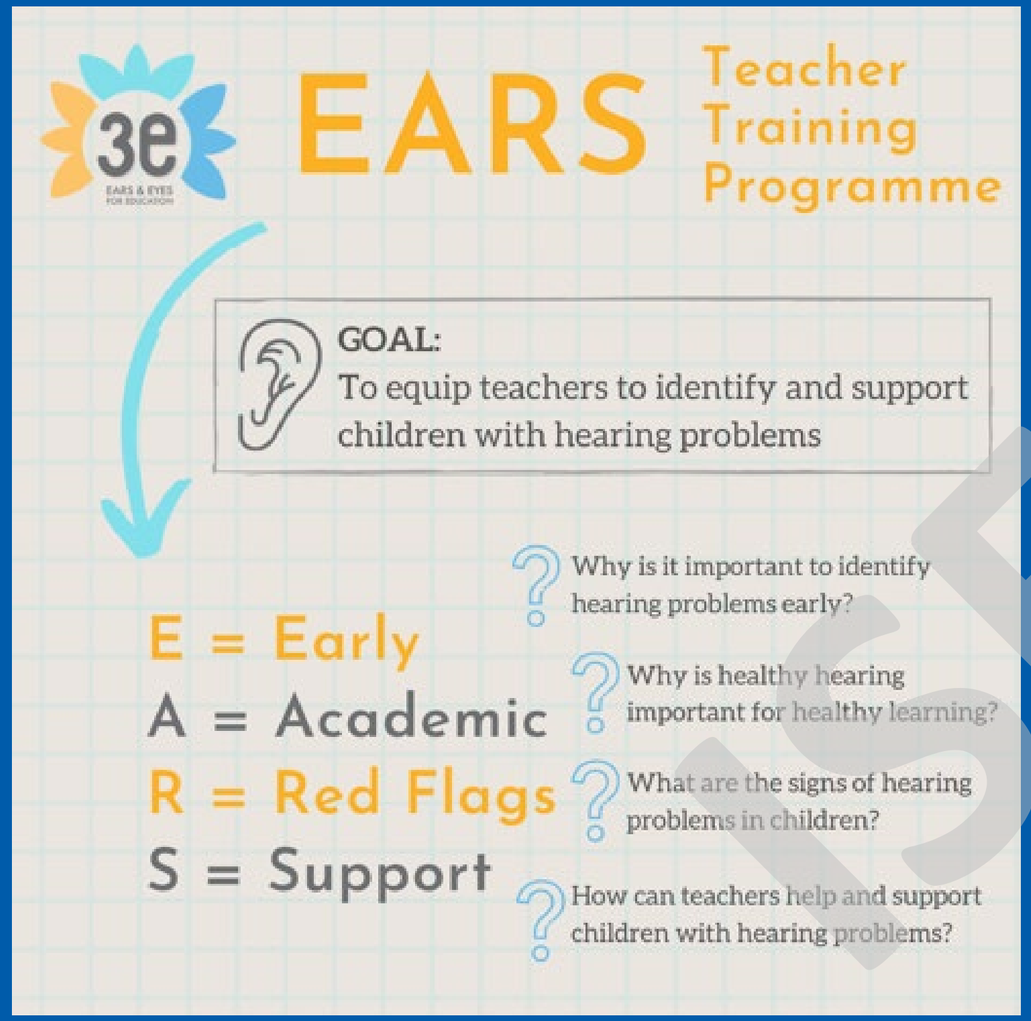
High referral rates

Stakeholder training

Intervention: Milestone guides & EARS

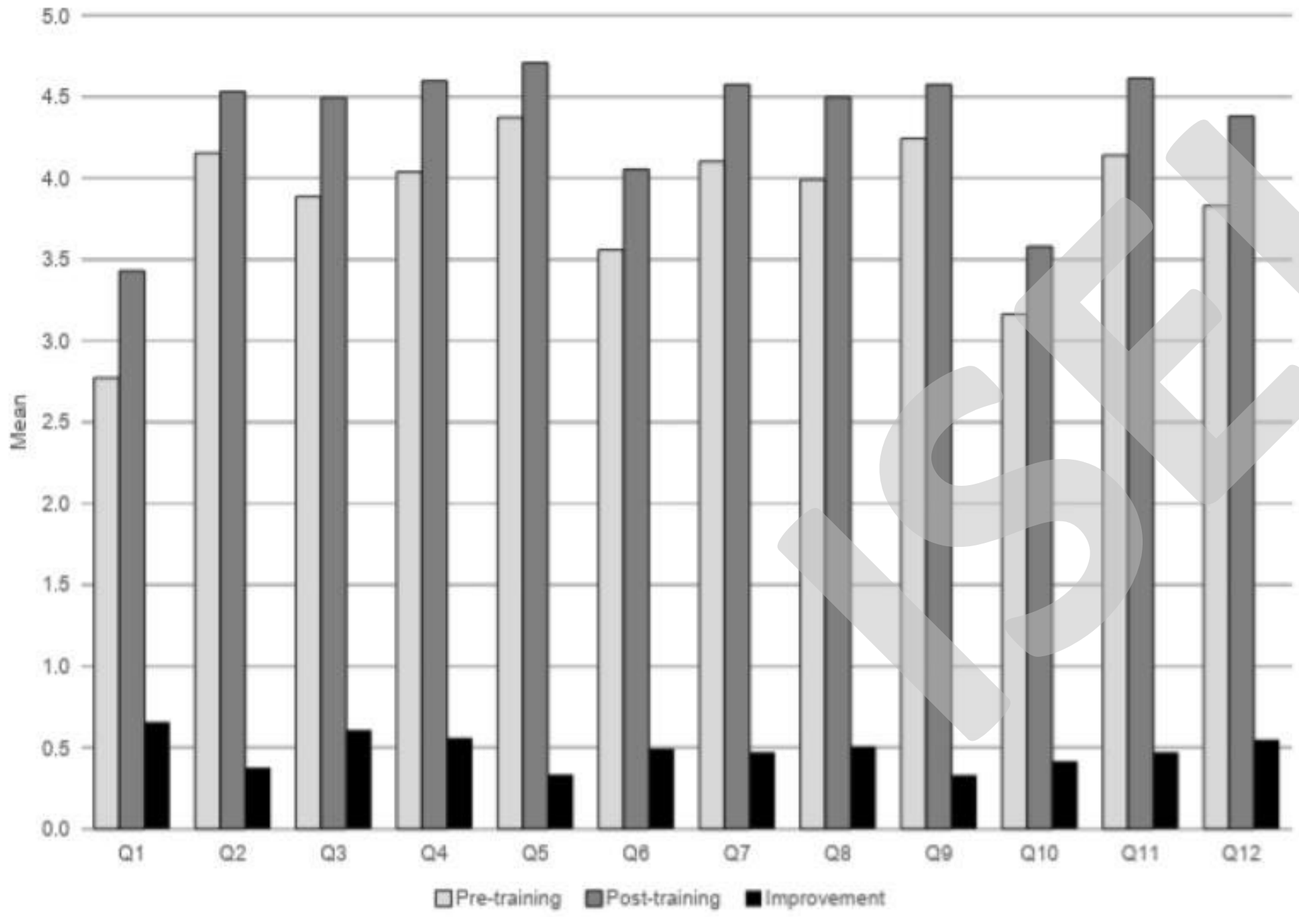
mHealth-Supported Hearing Health Training for Early Childhood Development Practitioners: An Intervention Study





Survey Items	
1.	ECD staff and teachers know enough about hearing and hearing problems in children.
2.	A child can be born with hearing problem.
3.	There are different types of hearing problems.
4.	Ear infections can cause hearing problems.
5.	It is important to know if a child has hearing problems at an early age to help them.
6.	Hearing problems in young children cannot be treated. [2]
7.	There are signs in a child's behaviour that may tell you if the child has a hearing problem.
8.	Hearing problems can make learning to read and write difficult.
9.	Hearing problems can make concentration in a classroom difficult.
10.	Even with treatment, children with hearing loss cannot achieve the same as other children in school. [2]
11.	If someone thinks a child has a hearing problem, the child should be sent to an audiologist.
12.	A child with a hearing problem can hear better in school if they sit in the front row of the classroom.

Results



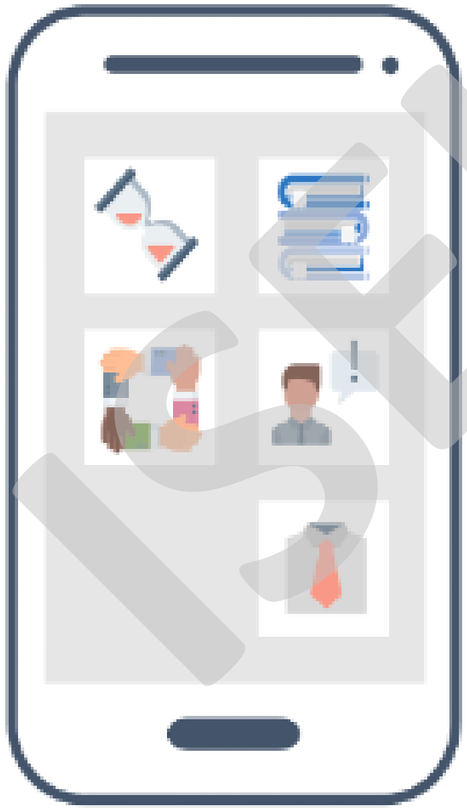
Significantly ($p < .001$, $WSR = -22.491$) better post-training mean scores.

Significantly better mean scores ($p < .001$, $WSR = -11.362$) between pre- and six-month post-training.

Results

Age
Older participants

Prior exposure
Participants with prior exposure



Level of training
Participants with *ECD training levels 1 to 3*

Home language
IsiXhosa speaking participants

Work position
Participants in working as a *Principal*

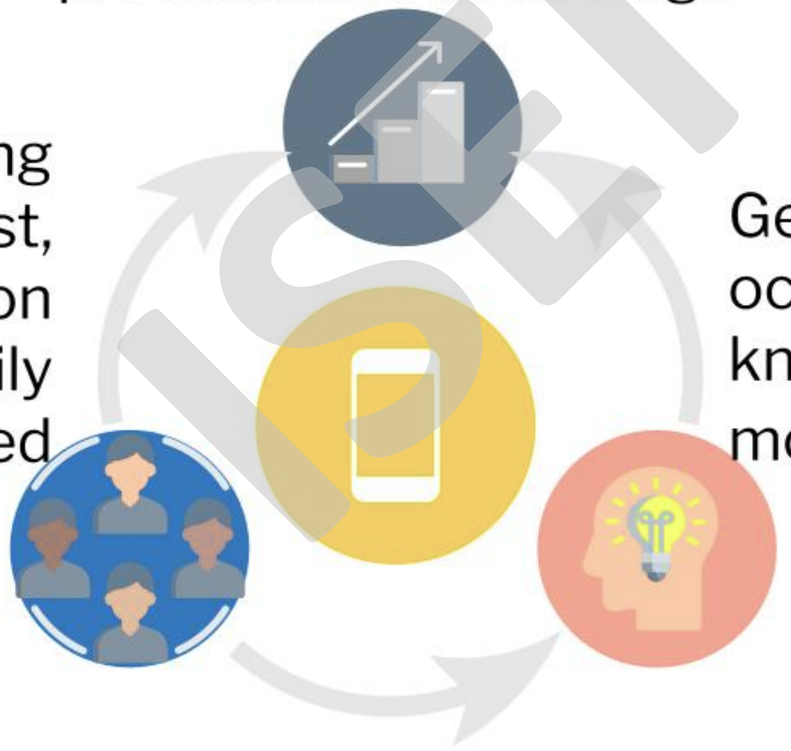
Content analysis

- Identifying hearing problems in children
  - *"…there is one child that I was suspecting and it turns out that I was right."*
- Sharing information
  - *"I have shared the important information with…"*
- Apply information in the classroom setting
  - *"I was more aware and could adapt my lessons…"*
- Assisting children with hearing problems
  - *"I am more…able to take care of a child with any hearing problems."*
- Assist and advise parents of children with hearing problems
  - *"I can… advise parents better…"*

Discussion

Significant improvement of ECD practitioners knowledge

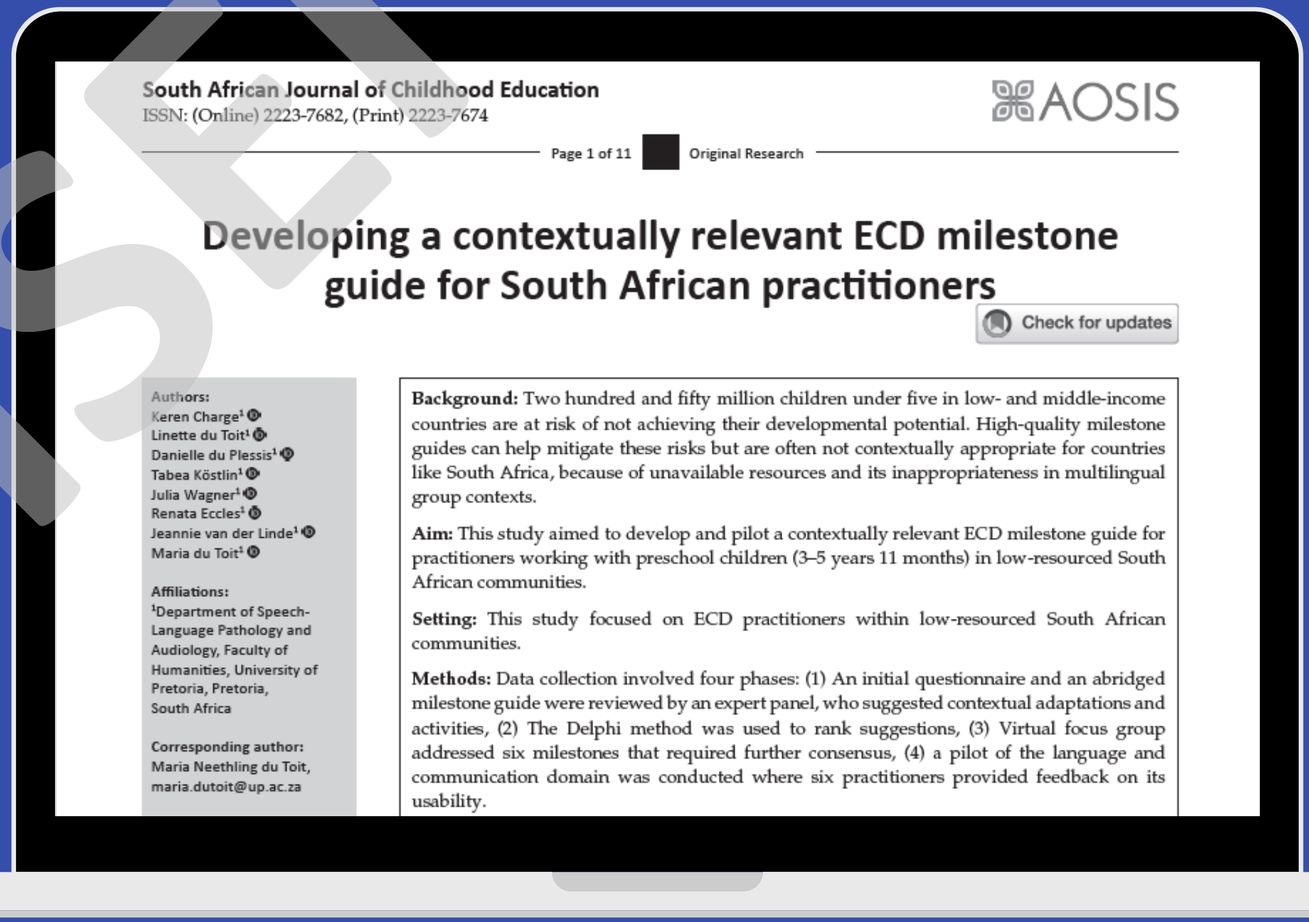
mHealth hearing training program is a low-cost, scalable intervention which is easily distributed



Generalisation also occurred with improved knowledge maintained six months post-training

Read online:

Scan this QR code with your smart phone or mobile device to read online.



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AOSIS

Page 1 of 11 Original Research

Developing a contextually relevant ECD milestone guide for South African practitioners

Check for updates

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Background: Two hundred and fifty million children under five in low- and middle-income countries are at risk of not achieving their developmental potential. High-quality milestone guides can help mitigate these risks but are often not contextually appropriate for countries like South Africa, because of unavailable resources and its inappropriateness in multilingual group contexts.

Aim: This study aimed to develop and pilot a contextually relevant ECD milestone guide for practitioners working with preschool children (3–5 years 11 months) in low-resourced South African communities.

Setting: This study focused on ECD practitioners within low-resourced South African communities.

Methods: Data collection involved four phases: (1) An initial questionnaire and an abridged milestone guide were reviewed by an expert panel, who suggested contextual adaptations and activities, (2) The Delphi method was used to rank suggestions, (3) Virtual focus group addressed six milestones that required further consensus, (4) a pilot of the language and communication domain was conducted where six practitioners provided feedback on its usability.

so what?

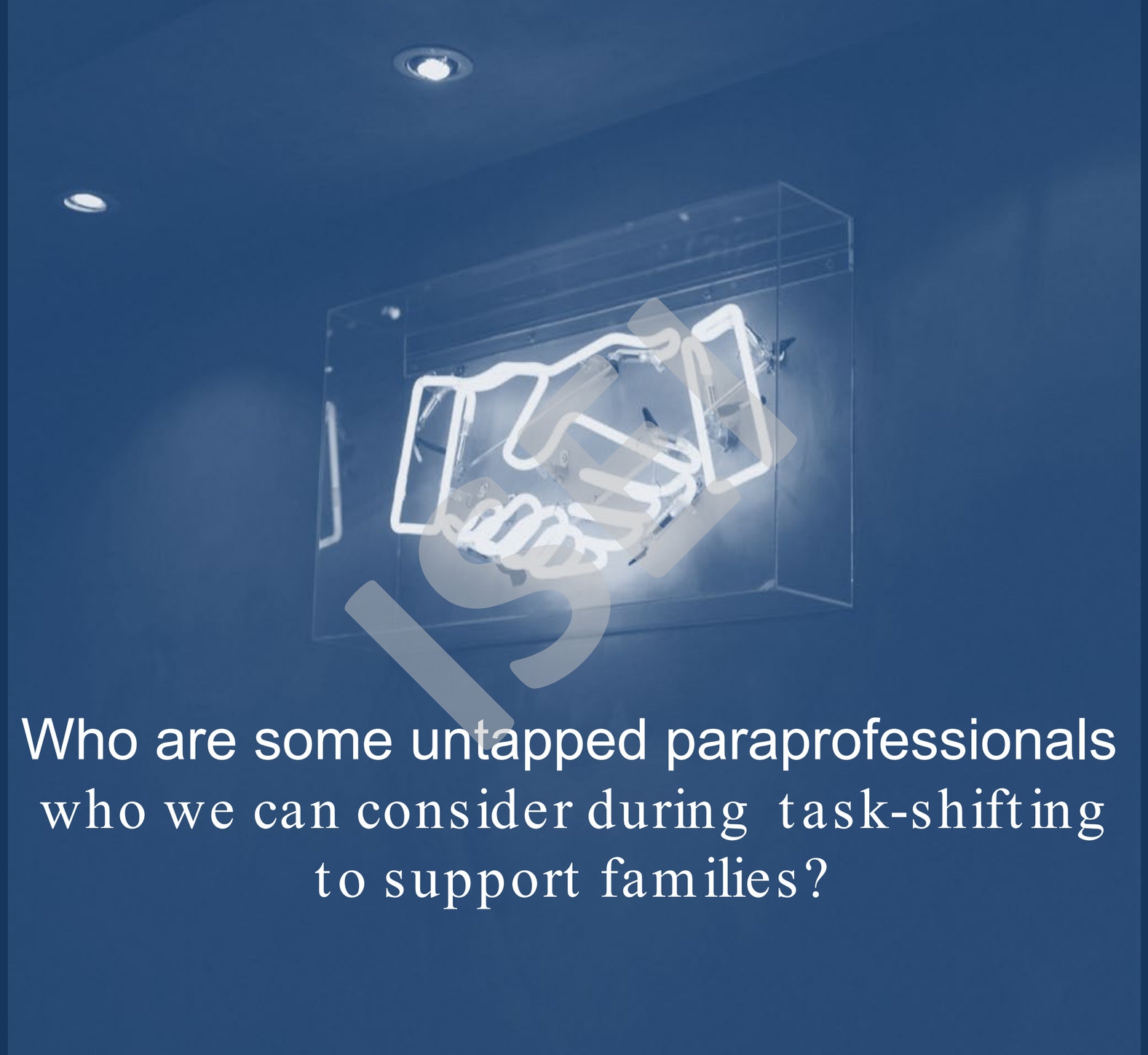
TAKE HOME MESSAGE

- Interval screening
- Innovation
- Interval screening policies
- mHealth

Who are the stakeholders in your community that you work with?

What are the benefits and barriers to using mHealth in your context?

Photo by Jakub Żerdzicki on Unsplash



Who are some untapped paraprofessionals who we can consider during task-shifting to support families?

THANK YOU

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