PAEDIATRIC HEARING LOSS IN PERI-URBAN KUMASI: STUDY RESULTS & POLICY IMPLICATIONS FOR NATIONAL CHILDHOOD HEARING SCREENING IN GHANA

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OUTLINE

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INTRODUCTION

- The World Health Organization (WHO) in 1948 defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."
- The current approach to disease prioritization tends to exclude nonfatal yet disabling conditions (Olusanya et al., 2006).
- According to WHO, 7% of the 466 million persons in the world living with disabling hearing loss are children (WHO, 2018).
- The prevalence of paediatric hearing loss in Ghana is currently unknown.

OBJECTIVES

- Main study objectives:
  - Identify prevalence of paediatric hearing loss in peri-urban Kumasi in children aged 3-15 yoa
  - Determine feasibility of using a portable screening (ShoeBOX iPad) audiometer
  - Evaluate the practicality of use of LittlEARS questionnaire
  - Identify follow up rate of children who refer on initial pure tone hearing screening

METHODS 1/2

- This study was nested in the Family Health & Wealth Study (FHWS), an open-cohort population-based study in peri-urban Kumasi
- Informed consent was sought from parents/caregiver and assent sought from children before enrollment
- A pilot study was conducted previously; challenges identified helped to inform modifications of study

METHODS 2/2

- Enrolled participants completed
  - Validated LittlEARS Questionnaire (LEAQ) by a parent/caregiver to assess auditory behavior
  - Ear inspection and otoscopic examination
  - Pure tone screening using ShoeBOX Audiometer in soundbooth housed in large mobile unit
    - Each child was conditioned
    - Screening at 1, 2, 4 kHz using warbled tones presented monaurally to right and left ears at 25 dB HL
    - Refer defined as failure to properly respond following presentation of a screening pure tone in either ear

SHOEBOX iPad Audiometer

Clearwater Clinical SHOEBOX iPad audiometer

https://clearwaterclinical.com/

Clearwater Clinical SHOEBOX iPad Audiometer

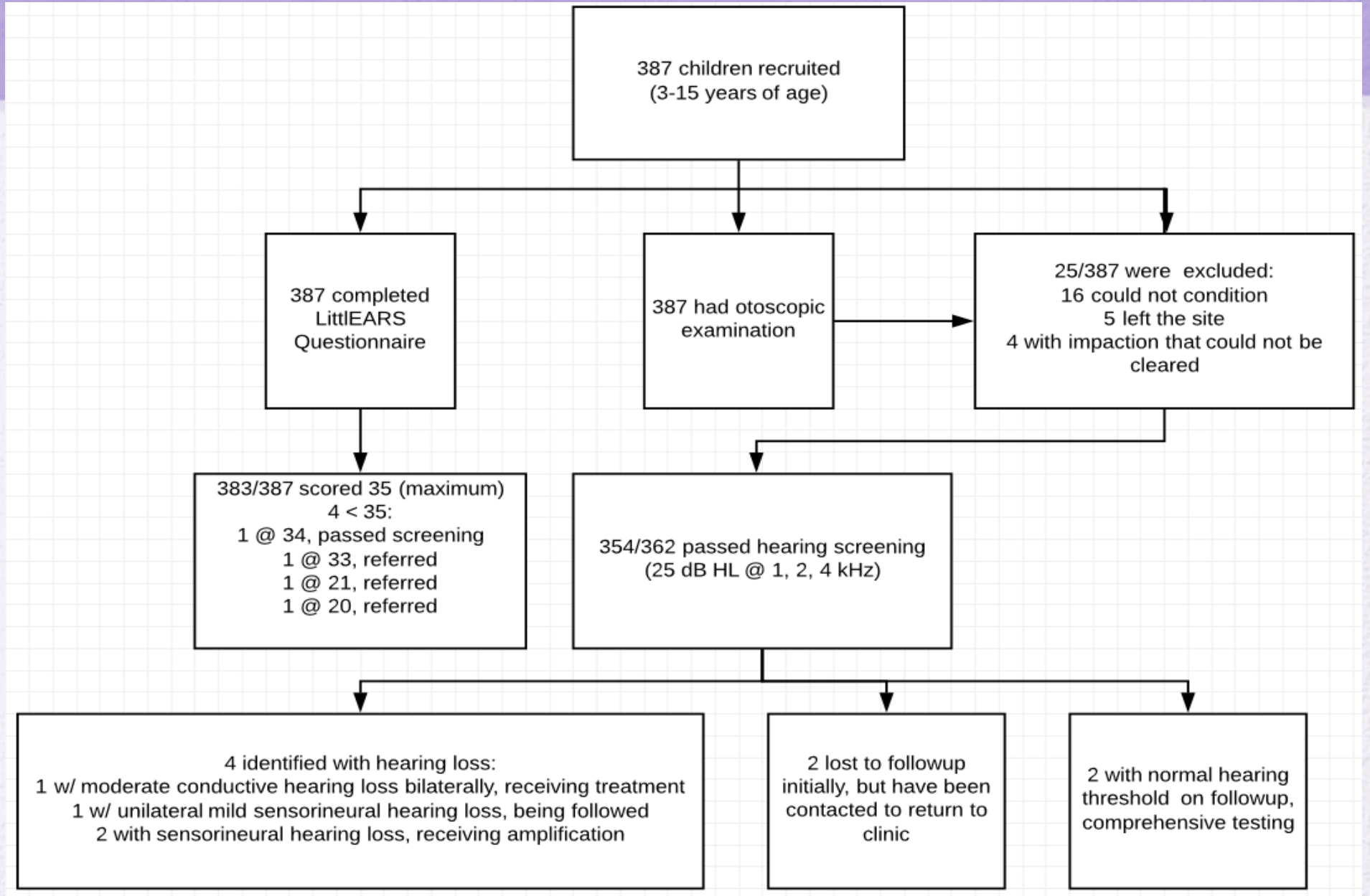
Clinical features:

- Pure tone: air & bone with masking
- Speech reception threshold, word recognition testing
- Manual, assisted, automated test modes
- REACTTM algorithm for background noise
- Extended high frequencies (to 16kHz)
- Embedded inventory, surveys, customized questionnaires

Data management:

- Web portal, accessible from browser
- Automatic back-up from iPad
- Secure, HIPAA-compliant storage
- Flexible search/filter capabilities for viewing data
- Electronic data transfer/export of patient test results
- Administrative control for assigning user access

RESULTS 1/2


387 children recruited
(3-15 years of age)
387 completed
LittlEARS
Questionnaire
387 had otoscopic
examination
25/387 were excluded:
16 could not condition
5 left the site
4 with impaction that could not be
cleared
383/387 scored 35 (maximum)
4 < 35:
1 @ 34, passed screening
1 @ 33, referred
1 @ 21, referred
1 @ 20, referred
354/362 passed hearing screening
(25 dB HL @ 1, 2, 4 kHz)
4 identified with hearing loss:
1 w/ moderate conductive hearing loss bilaterally, receiving treatment
1 w/ unilateral mild sensorineural hearing loss, being followed
2 with sensorineural hearing loss, receiving amplification
2 lost to followup
initially, but have been
contacted to return to
clinic
2 with normal hearing
threshold on followup,
comprehensive testing

RESULTS 2/2: Notable on Otoscopy

- Zero children with active ear infection
- 5/387 (1%) with foreign body in ear
- 151/387 (39%) with occluding wax in one/both ears

CONCLUSIONS/NOTES

- Aims of the study met
  - established the feasibility of using a portable screening and/or a questionnaire
  - determine the prevalence of paediatric hearing loss
    - prevalence of paediatric hearing loss greater than 25 dB HL at 1, 2, or 4kHz in peri-urban Kumasi is currently estimated to be 2.21%
- Follow up rate was 75% (6/8 children)
- Note: further followup for 25 excluded children being conducted currently
- Note: Environmental noise levels outside of sound booth affect conduct of hearing screening efforts

RECOMMENDATIONS

- Hearing loss in Ghanaian children should be treated as a public health problem.
- Portable hearing screening devices are essential and useful in that effort.
- Noise in area is a significant impediment to successful screening.
- MOH/Ghana Health Service/Otolaryngology Society of Ghana/Speech Therapists & Audiologists Association of Ghana could collaboratively support implementing a national programme of early identification and intervention of hearing loss in children.

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- School of Public Health, Kwame Nkrumah University of Science & Technology
- FHWS Coordinators

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