Screening for hearing loss with mHealth solutions

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With the number of people suffering from hearing loss growing all the time, the need for early detection and intervention is imperative. De Wet Swanepoel discusses two examples of mHealth possibilities for hearing screening which, as a low cost solution, would be particularly useful for providing hearing tests in underserved regions.

Hearing loss is a leading contributor to the global burden of disease (GBD), with one in seven people affected [1]. The recent GBD report estimated that almost a billion people (940 million) suffered from hearing loss in 2015 [1]. This makes it the second most common impairment, ahead of visual impairment, as measured on the years lived with disability (YLD) index. As acknowledged in this influential GBD report, timely provision of medical and audiological interventions, has the potential to significantly reduce this burden. The first point of entry for providing appropriate interventions however, requires early detection options that are accurate, efficient and widely accessible.

mHealth, broadly defined as any use of mobile technology to address healthcare challenges such as access, quality, affordability, matching of resources, and behavioural norms, promises exciting new possibilities [2,3]. Considering the explosion in mobile connectivity and the rapid advances of smartphone technologies, the field of mHealth is emerging as a powerful tool to support and provide affordable and equitable access to health, especially in underserved world regions. The field of hearing healthcare is starting to embrace mHealth for decentralised access to early detection of hearing loss using low-cost solutions [3].

Two broad approaches to mHealth screening for hearing loss include an end-user model or a point-of-care diagnostic device operated by a facilitator. Each of these approaches have their respective advantages and limitations which should be weighed up against application within different contexts and for different populations.

Point-of-care mHealth hearing screening

Accurate hearing screening at community-based contexts, such as home visits, schools and primary healthcare clinics, can be facilitated by minimally trained persons using low-cost mHealth tools. Our research on the hearScreen Android-based software application (www.hearscreen.com) has demonstrated that accurate calibration and real-time noise monitoring is possible on supported devices, which allow for clinically valid pure tone audiometric screening when linked with a calibrated headphone [4,5]. Recommended hearing screening protocols can be pre-programmed for automated testing employing a forced-choice response paradigm: ‘Did the child respond? Yes / No’

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Child being screened with the hearScreen App
The community health workers had no prior training in hearing screening but could conduct successful tests on children and adults as part of their routine home visits after one four-hour training session.

References


