

RESEARCH REPORT

Karina C. De Sousa

Supervisors: De Wet Swanepoel and David R. Moore

TITLE OF THE STUDY

Decision-support and help-seeking on a smartphone screening App

INTRODUCTION

This research study was led by Karina De Sousa (nè Swanepoel) under supervision of Professors De Wet Swanepoel and David Moore.

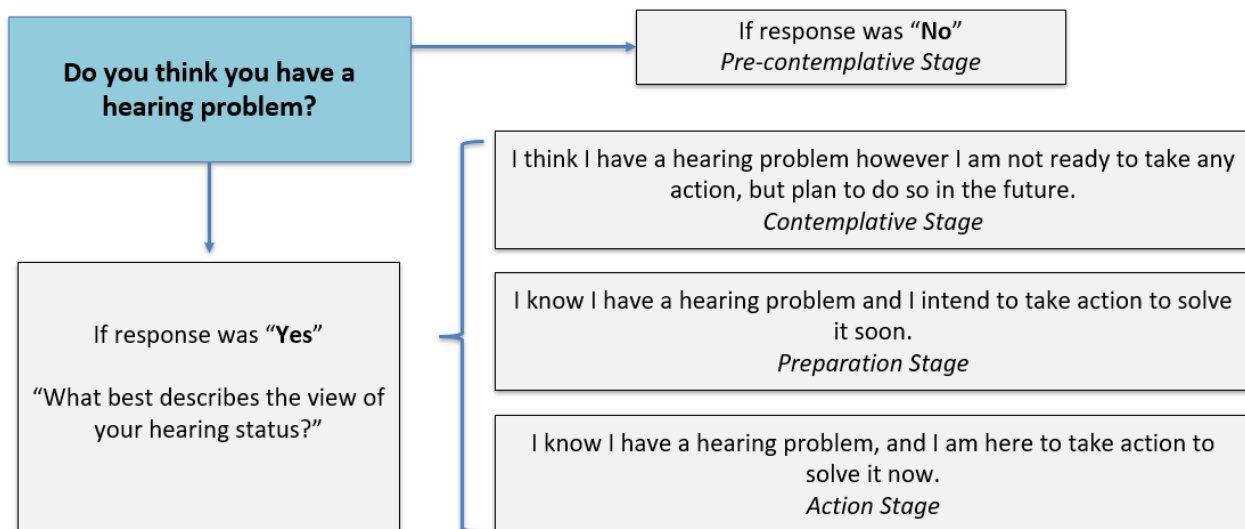
In recent years, digits-in-noise (DIN) tests have become popular in consumer-based hearing loss detection. A DIN test measures a person's ability to adequately hear speech in noise, using digit triplets (e.g. 4-2-6) presented in background masking noise. To allow for widespread access, even in low-and-middle income countries like South Africa, the test was released as downloadable smartphone app in March 2016, called *hearZA*. The app delivers a DIN test binaurally in three minutes, is the first of its kind and has been validated and released on Android and iOS platforms. The App allows those who failed the DIN to request contact from their closest audiologist. In partnership with industry and professional societies, a secure portal links referral to audiology practices based on geolocation. This technology has the potential to make a considerable impact in developing world-regions since services are limited. In sub-Saharan Africa for example, there is only one audiologist per million people. This app can detect untreated hearing loss and link individuals to their closest hearing health care provider based on geolocation. As South Africa's national hearing test, the *hearZA* app has been implemented successfully with more than 58 000 tests taken to date. Despite a failed hearing screen, however, some individuals may opt not to connect with an audiologist or pursue intervention. This research project aimed to determine the effect of an in-app decision support tool, namely the adapted Ida Institute's 'Why improve my hearing?' telecare tool, on the follow up actions and intervention following a failed test.

METHOD

Using a randomized control trial, app-users were divided into either a treatment or control group. The researchers had no contact with the app-users. App-users in the control group used an app-version that only provided general information on hearing loss following the test result (consequences, who can do a diagnostic assessment and a prompt to connect with an audiologist). The 'Why improve my hearing?' tool was adapted and contextualized from the current Ida tools and customized into an app-based module, which was provided as an optional guide to users in the intervention group. A staging algorithm based on the transtheoretical model of health behaviour change, recently demonstrated to

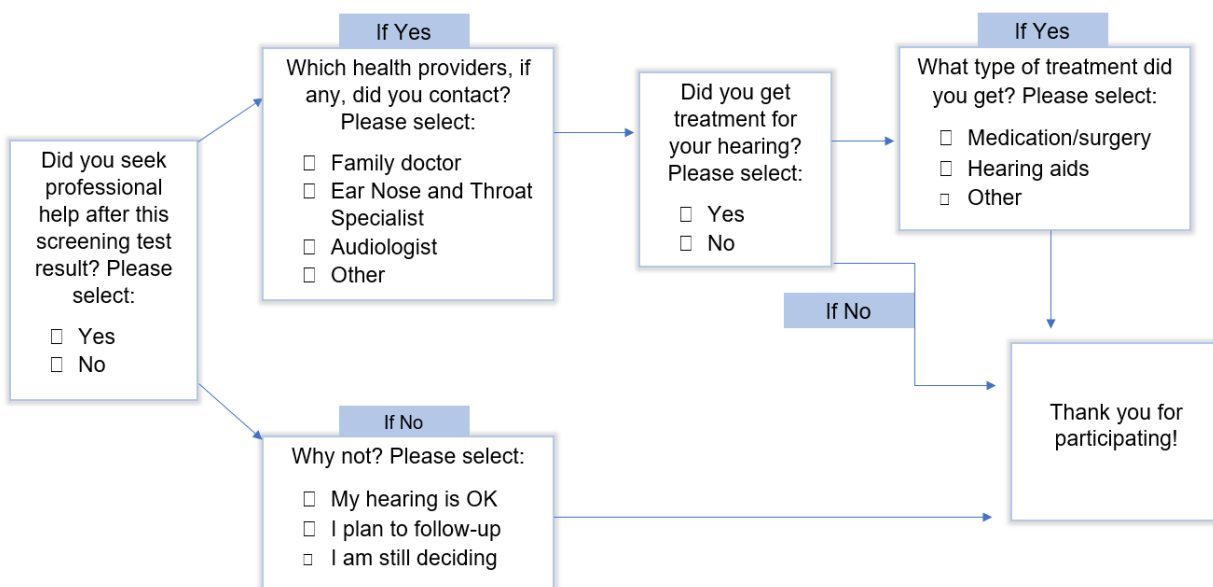
have good predictive ability for help-seeking was also included as a baseline measure for every hearZA user (Fig. 1). A post-test survey (Fig. 2) was sent through the smartphone notification dashboard to users who failed, 1 month after the test to determine follow up actions and possible intervention pursued.

Fig 1. Staging Algorithm as baseline measure of readiness to manage hearing loss



Laplante-Levesque et al. 2013, Ear Hear; Ingo et al. 2017, Int J Audiol

Fig 2. Post-test survey sent to control and intervention group through the smartphone notification dashboard.



KEY FINDINGS

From initiating the study, 1290 people used the hearZA App. Of those, 675 (52%) failed the test. Surveys were sent to each of these app users, one month following the failed test result. A total of 508 people who failed the test, received the control group app version (excluding the Ida tool). To date 167 people received the app version with the decision support tool, of which 20 (6.5%) completed the tool. A total of 61 users (9%) completed post-test surveys. Fifty respondents were in the control group, and 11 in the intervention group. In the intervention group, only one respondent completed the *'Why improve my hearing'* tool to date.

For the entire sample who failed the test (675), the majority (57%) of users indicated that they were in a pre-contemplative stage of change, with only 7.5% indicating being ready to take action (action stage). Twenty-four respondents (48%) in the control group, and seven (63%) in the intervention group were in pre-contemplation stages of change. Across all respondents, eight people followed up with a hearing health professional (seven in the control group and one in the intervention group) and six went on to receive intervention (hearing aids, medical intervention or other). One respondent in the intervention group who completed the *'Why improve my hearing'* tool, did not follow up with a hearing healthcare provider.

CONCLUSIONS

Low follow-up rates following completion of the hearZA test were evident. There is thus a need to transition app-users who failed a test towards readiness for seeking further help and intervention. However, for those who failed the test and received the app version including the Ida tool, less than 7% completed the tool to date. Previous research has been shown that the tool enhances patient-centeredness and better prepares a person for an audiological assessment, yet many app-users were not inclined to complete the optional tool. Repositioning the tool within the workflow of the app, for example before test results are provided, may facilitate greater uptake. Response to post-test surveys were a significant challenge, therefore the study will still be ongoing. Future work would include software changes to reposition the tool in the app and investigating post-test follow up.

