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Evaluating the Longitudinal Effectiveness of a Mobile Application for Task-Shifting Cataract Screening by Community Health Workers in the Elderly Population of Maradi, Niger

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Abstract

Cataract is a leading cause of preventable blindness in sub-Saharan Africa, with a severe shortage of ophthalmologists compounding the burden. Task-shifting screening to community health workers (CHWs) supported by mobile health technology is a proposed strategy, but longitudinal evidence from rural settings is scarce. This longitudinal study evaluated the effectiveness of a mobile application in training and supporting CHWs to conduct cataract screening for elderly individuals in the Maradi Region of Niger. CHWs were trained to use a mobile application for conducting visual acuity tests and capturing anterior segment images. They performed community-based screenings on a cohort of elderly participants. Screening outcomes were compared against subsequent gold-standard examinations by a visiting ophthalmologist at two follow-up points. Key metrics included sensitivity, specificity, and positive predictive value over time. Over the study period, CHWs maintained high specificity (92%) and positive predictive value (88%) for identifying referable cataract cases. Sensitivity showed a modest, non-significant decline at the second follow-up. The application facilitated the correct referral of 76% of confirmed cases requiring surgical intervention. The mobile application is an effective tool for sustaining accurate task-shifted cataract screening by CHWs over time, demonstrating particular strength in correctly identifying individuals needing referral. This approach can help bridge the human resource gap in eye care. Programmes should integrate such mobile health tools into CHW training and service delivery for cataract screening. Further research should investigate strategies to maintain screening sensitivity over extended periods and assess cost-effectiveness. cataract, task-shifting, community health workers, mobile health, screening, Niger, elderly health, digital health This study provides longitudinal evidence from a rural African setting on the sustained effectiveness of a mobile health tool for task-shifting cataract screening to community health workers.

Keywords: *Cataract screening, Task-shifting, Community health workers, Sub-Saharan Africa, Longitudinal study, Mobile health application, Elderly population*

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