



# Replication Study: Adoption and Clinical Outcomes of the PEEK Smartphone Vision-Testing Application by School Nurses in Lusaka Province, Zambia

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## Abstract

The Portable Eye Examination Kit (PEEK) smartphone application is a tool for community-based vision screening. Its adoption and clinical outcomes when used by school nurses within routine services in sub-Saharan Africa require further investigation. This study replicates prior research on task-shifting in vision screening within this specific context. This study aimed to replicate an investigation into the adoption and clinical outcomes of the PEEK application when used by school nurses in Lusaka Province, Zambia. Its objectives were to assess the application's adoption rate, the clinical accuracy of nurse-led screenings against a standard optometric assessment, and the completion rate of the referral pathway for children identified with vision impairment. A cross-sectional study was conducted. Trained school nurses used the PEEK acuity test to screen children in selected schools. A subset of children, comprising all who failed the screening and a random sample of those who passed, received a confirmatory optometric examination. Adoption was measured using nurse surveys and usage logs. Clinical outcomes were determined by comparing nurse screening results to the optometrist's diagnosis. Adoption among trained school nurses was high, with most routinely using the application. The sensitivity of nurse-led PEEK screening for identifying significant vision impairment was 92%, and specificity was 89%. However, only 65% of children referred for further care attended a follow-up appointment. The PEEK application is a feasible and clinically accurate tool for vision screening when used by school nurses in this setting, replicating key prior

findings. The primary barrier to effective service delivery was the subsequent referral pathway, not the technology. Integration of the PEEK application into school health programmes is supported. To maximise impact, concurrent strengthening of the referral system and community engagement is essential to improve follow-up care completion. vision screening, school health, task-shifting, mobile health, referral system, Zambia, nurses. This replication study provides independent evidence on the operational feasibility and clinical accuracy of a task-shifting model for vision screening in a sub-Saharan African school setting, highlighting a critical gap in referral completion.

**Keywords:** *Replication study, Community health services, Sub-Saharan Africa, Mobile health applications, Vision screening, School nursing, Clinical outcomes*

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