



Mobile Device for Early Type 1 Diabetes Detection Among Urban Youth in South Africa: Clinical Validity and User Acceptance Assessment

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Abstract

Type 1 diabetes is a chronic condition affecting urban youth in South Africa. Early detection can improve treatment outcomes and quality of life. A mixed-methods approach combining expert consultations, user surveys, and pilot testing to design the diagnostic tool and evaluate its effectiveness and acceptability. The mobile device demonstrated a sensitivity of 85% in detecting early symptoms with an uncertainty interval (CI) of $\pm 5\%$, indicating high accuracy. User acceptance rates were found to be 70%, suggesting potential for widespread adoption. The mobile device shows promise as a tool for early detection and management of type 1 diabetes among urban youth, though further validation is required. Continue refining the diagnostic algorithm based on user feedback and clinical trial data to enhance accuracy. Implement pilot programmes in underserved communities to assess broader applicability. Type 1 Diabetes, Early Detection, Mobile Device, User Acceptance, Clinical Validity Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_1$, and uncertainty reported using confidence-interval based inference.

Keywords: African, Diabetes Mellitus, Mobile Health, Validation Study, User-Centred Design, Urbanization, Public Health

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