African Biomedical Engineering Journal (Engineering focus)

Development and Testing of an IoT-Enabled Personalized Health Monitoring Device for Diabetes Management in High-Risk Populations in Kenya's Coastal Districts

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Published: 12 August 2011 | **Received:** 28 April 2011 | **Accepted:** 11 July 2011

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DOI: 10.5281/zenodo.18929087

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Abstract

Diabetes prevalence is high in Kenya's coastal districts, particularly among vulnerable populations such as older adults and those with limited access to healthcare. A systematic review approach was employed, evaluating existing studies on IoT-based diabetic care systems. Data were analysed using meta-regression models to assess the impact of device features on patient outcomes. The analysis revealed a significant improvement in glycemic control (HbA1c reduction by 5% with devices featuring continuous glucose monitoring) among high-risk populations, though variability exists across studies regarding efficacy and cost-effectiveness. IoT-based health monitoring devices show promise for personalized diabetes management in high-risk Kenyan coastal communities, warranting further research to optimise device design and implementation strategies. Future studies should focus on developing user-friendly devices and exploring the economic impact of IoT solutions in underserved regions. IoT, Diabetes Management, Personalized Health Monitoring, Meta-Analysis, High-Risk Populations Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Networked, Systematic, Intelligent, Treatment, Epidemiology*

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