African Primary Care Nursing

Community-Wide Physical Activity Campaigns with Wearable Devices and Their Impact on Heart Health in Johannesburg, South Africa: A Twelve-Month Assessment

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Abstract

Globally, cardiovascular diseases (CVDs) are a leading cause of mortality in South Africa. Physical activity is a critical modifiable risk factor for CVD prevention and management. Participants were recruited from diverse socio-economic backgrounds in Johannesburg. The intervention comprised a series of educational sessions and regular group walks facilitated by trained volunteers. Wearable devices tracked daily physical activity levels, which were analysed using machine learning algorithms to assess adherence and effectiveness. The campaign resulted in an average increase of 15% in participants' step counts over the twelve-month period, with a significant reduction ($p < 0.05$) in systolic blood pressure among those who used wearable devices consistently for at least six months. This study underscores the potential of community-based interventions and wearables to improve heart health outcomes in urban South Africa. Future research should explore the long-term sustainability of such campaigns and assess their impact on other CVD risk factors. Physical Activity, Wearable Devices, Heart Health, Johannesburg, South Africa Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African Geography, Cardiovascular Diseases, Community Health Interventions, Physical Activity Monitoring, Wearable Technology, Public Health Initiatives, Epidemiology*

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