



Improving Diabetes Management and Cardiovascular Risk Factors Through Peer-Led Self-management Support Groups in Western Kenya

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In sub-Saharan Africa, projections anticipate a 110% rise in the number of people with diabetes mellitus (DM) from 19.8 million to 41.5 million by 2035 (1). This growth is attributed primarily to the multiple downstream ramifications of urbanization and westernization. Poor access to medications, finances, transportation, and skilled health care providers trained in DM management is a barrier that contributes to poor outcomes for patients with DM (2). As a result, patients are often forced to rely on self-management without guidance from the formal health care sector. To combat this barrier, diabetes self-management support (DSMS) programs sustain psychosocial support and education by incorporating lay DM patients as peer support group leaders at the community level (3,4). Limited data exist for DSMS outcomes in low- and middle-income countries (LMICs). The imminent rise of DM and the logistical challenges of health delivery in LMICs mandate a culturally- and resource-appropriate model of sustainable education and support at the community level.

We conducted a proof-of-concept study to evaluate the impact of a 6-month DSMS intervention on DM and cardiovascular disease risk factors in western Kenya. This pre-post implementation study was

initiated at peri-urban and rural DM clinics in the catchment area of the Moi Teaching and Referral Hospital. Participants ($n = 148$) were enrolled from clinics and then divided into 12 groups based on location of residence. Eligibility criteria included age ≥ 18 years and diagnosis and treatment of type 1 or type 2 DM for at least 2 years prior to enrollment. From each group, a peer leader completed a 4-week training per the International Diabetes Federation *Peer Leader Manual* (3). Peer leaders guided bimonthly group meetings, which focused on self-empowerment and problem-solving surrounding behavioral modification and self-management skills. Outcomes measured include change in glycosylated hemoglobin (HbA_{1c}) level, systolic blood pressure (SBP), DM knowledge, and BMI. Generalized linear mixed models were used to estimate changes in primary outcomes, adjusting for potential confounding variables.

Following the 6-month study period, HbA_{1c} improved ($\beta -0.17$, SE 0.09, $P = 0.050$), after adjusting for age with a median decrease from 9.6% (81 mmol/mol) to 8.7% (72 mmol/mol). Sex, education, peer group, tribe, glucometer use, insulin use, and BMI were not independently associated with HbA_{1c} improvement. SBP also improved ($\beta -5.67$, SE 1.64, $P = 0.001$),

with a median decrease from 132.4 mmHg to 127.5 mmHg. There were no changes in DM knowledge or BMI. Nine of the 12 groups elected to continue ongoing peer group meetings even after the study period and stipend support ended.

This study is the first to report positive outcomes for peer-led, in-person DSMS groups in an LMIC. Implementation of DSMS in western Kenya significantly improved HbA_{1c} and SBP after 6 months. Longer follow-up and inclusion of a control group are warranted in future implementation studies. The rising burden of DM in LMICs warrants a call for novel approaches at the community level. The DSMS model has great potential to answer this call.

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Author Contributions. P.H.P. designed the study, collected and analyzed data, and wrote,

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reviewed, and edited the manuscript. C.K.W. designed the study, collected data, and reviewed and edited the manuscript. S.A. collected data and reviewed and edited the manuscript. J.R.E. analyzed data and wrote, reviewed, and edited the manuscript. L.M. collected and analyzed data and reviewed and edited the manuscript. J.S.N., S.D.P., G.S.B., and J.H.K. designed the study and reviewed and edited the manuscript. P.H.P. is the guarantor of this work and, as such, had full access to all the data in the study and takes

responsibility for the integrity of the data and the accuracy of the data analysis.

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