Implementation and evaluation of a nutrition education programme for adults with type 2 diabetes mellitus in a resource limited setting of Moretele sub-district North West Province, South Africa.

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Aim: To implement a tailored nutrition education (NE) programme for adults with type 2 diabetes mellitus (2DM) in a resource limited area and to evaluate the programme's effectiveness on glycaemic control and other health and related outcomes (BMI, blood pressure, lipid profile, dietary behaviours, diabetes knowledge and the attitudes towards diabetes and its treatment).

Objectives: To determine the differences between the intervention and control groups at six months and 12 months for HbA_{1c}, (primary outcome) and the secondary outcomes (BMI, blood pressure, lipid profile, dietary behaviours, diabetes knowledge and the attitudes towards diabetes and its treatment), to determine the within group changes at six and 12 months and to determine the between group differences in the proportion of participants achieving HbA_{1c} targets ($< 7\%$).

Methods: This was phase 3 (quantitative domain) of a three phase study conducted at two community health centres in Moretele, North West Province, South Africa. A NE programme based on previously assessed needs was implemented among adults with poorly controlled ($HbA_{1c} \geq 8$) type 2DM (40 to 70 years) over one year. Participants were randomised into either the intervention group (n=41; 8 weekly group education (2-2.5 hours); follow-up meetings and education materials) or control group (n=41; education materials only). Outcomes were assessed at baseline, six months and 12 months. An analysis of covariance (ANCOVA) (Rank ANCOVA for dietary intake) compared the groups on measured outcomes using baseline values, age, gender, and clinic as covariates. Paired t-test or sign rank test compared within group changes.

Results: 38 participants in each group completed the study. There were no significant group differences at baseline. The differences in HbA_{1c} between the intervention and control groups were -0.62% (p=0.15) at six months and -0.67% (p=0.16) at 12 months in favour of the intervention group. Four intervention and one control group participants achieved HbA_{1c} target ($<7\%$) at both six and 12 months, [(p=0.20), (p=0.36)] respectively. There were no

significant between group differences in BMI, lipid profile and blood pressure at six months and 12 months. Within group changes showed significant reductions in BMI for the intervention group, total cholesterol (p<0.0003), diastolic and systolic blood pressures (p<0.02) in both groups at six months respectively.

The intervention group had significantly lower starchy foods intake (median servings) in comparison to the control group, 9.3 vs. 10.8 (p=0.005) at six months and 9.9 vs. 11.9 (p=0.017) at 12 months and within the group changes at the two time periods (P=0000). More intervention participants were growing own vegetables compared to the control group 17/41 vs. 5/40 (p=0.003) at six months and 16/38 vs. 5/38 at 12 months. No significant group differences in the intake of energy, macronutrients, vegetable and fruits, sodium, cholesterol and fibre were observed at six and 12 months. Within group energy intake showed significant reductions in both groups at six months (p<0.0001) and at 12 months for the intervention group (p<0.0001). Within group vegetable and fruits intake (servings) indicated a significant increase in both groups at six months (p<0.05) and 12 months (p<0.003).

Diabetes knowledge scores increased significantly in the intervention compared with the control group, +0.95 (p=0.033) at six and +2.2 (p=0.000) at12 months. There were no significant group differences in the attitudes towards diabetes and its treatment.

Programme participation: The participation in the weekly and monthly/bi-monthly meetings by the intervention group participants was high (>80%). The participants reported high satisfaction with the programme, they felt they had greatly benefited from participating and they recommended the programme for other people living with diabetes.

Conclusions: A tailored NE can contribute to improvement in diabetes knowledge and specific dietary behaviours in communities in resource-poor settings. It is also promising in improving glycaemic control. It can also contribute to participants' satisfaction, perceived benefits and high participation rates.