Can a Culturally Tailored Diabetes Program Effectively Reduce Diabetes Risk in a Low-Income Latino Population?

Ockene IS, Tellez TL, Rosal MC, et al. Outcomes of a Latino community-based intervention for the prevention of diabetes: The Lawrence Latino Diabetes Prevention Project. Am J Public Health 2012;102;336–42.

Study Overview

Objective. To determine if a tailored version of the Diabetes Prevention Program (DPP), known as the Lawrence Latino Diabetes Prevention Project (LLDPP), can lead to weight loss and decreased type 2 diabetes risk in a low-income, Latino population.

Design. Randomized controlled trial.

Setting and participants. The Lawrence Latino Diabetes Prevention Project (LLDPP) was conducted between 2004 and 2007 and included 312 Latino participants (60% Dominican origin, 40% Puerto Rican origin) at high risk for type 2 diabetes. Seventy-eight percent of participants were recruited from the Greater Lawrence Family Health Center (GLFHC) patient panel in Lawrence, Massachusetts; the remainder was recruited through radio, television, and newspaper announcements and mailings to non-GLFHC physicians. Male and female adults aged 25 and older were recruited based on self-reported Latino/Hispanic ethnicity and were included in the study if their body mass index (BMI) was greater than 24 and if their likelihood of being diagnosed with diabetes over the next 7.5 years was greater than 30% (determined by a predictive algorithm) [1]. Participants were excluded from the study if they were unable to walk ¼ of a mile (5 city blocks), had limiting medical conditions, or if their medication use or medical condition would prevent an accurate diabetes risk assessment. Participants were randomized to either lifestyle intervention care (IC) or usual care (UC) by randomized block design, with multiple participants from one household placed in the same intervention arm.

Intervention. The LLDPP intervention was culturally tailored to the local Latino community and designed to be less intensive (13 sessions instead of 20) and more flexible (individual sessions were conducted in participant homes) than the DPP. Investigators utilized Latino focus groups to identify knowledge gaps, challenges, and attitudes around diabetes and to test the acceptability of educational materials. The intervention was tailored culturally by structuring discussions of diet around Latino foods and recipes, delivering the intervention by bilingual individuals, and using modes of Latino popular culture, specifically the Spanish soap opera (novela). Varying lev-

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els of literacy were addressed using visual materials and by simplifying the formatting of worksheets and other written materials—all created in both English and Spanish. Intervention goals focused on diet and physical activity, and included increasing intake of whole grains and nonstarchy vegetables, reducing intake of total and saturated fat, portion sizes, sodium, and refined carbohydrates and starches, and increasing walking by 4000 steps per day over baseline. Three Spanish-speaking individuals from the community with some undergraduate experience in nutrition delivered the LLDP intervention to participants. A behavioral psychologist and nutritionist trained and supervised these individuals focusing on theoretical background, protocol delivery, and motivational counseling skills.

Main outcome measures. Weight loss and hemoglobin A1C (HbA1C) level at the end of year 1. The study was underpowered to detect differences in incidence of diabetes at 1 year. Secondary measures included fasting lipid, glucose, and insulin levels, blood pressure, dietary assessment (24-hour dietary recall assessments at 3 time points), physical activity measures, and quality of life and depression scores. Fasting blood glucose and insulin measures were used to estimate insulin resistance using the homeostasis model assessment (HOMA-IR) calculation. Dietary recalls were conducted by Spanish-speaking dieticians blinded to the participant's condition on 2 randomly selected weekdays and 1 weekend day during a 3-week period.

Main results. A total of 949 patients were assessed for eligibility. About half (n = 466) were excluded due to ineligibility based on initial diabetes risk assessment [1]. Other reasons for exclusion included inability to walk 5 blocks and inability to obtain provider approval. The 312 eligible participants were randomly assigned to either the intervention (IC, n = 162) or control (UC, n = 150) arm. Ninety-four percent of participants completed the study at year 1, with 11 participant dropouts from the IC group and 7 from the UC group. Five participants were excluded from analysis because of gastric bypass surgery (2) and incomplete data (3), leaving 142 in the UC and 147 in the IC. The patient sample was predominantly female (74%). Most participants were employed (46%) and had not completed high school (59%). Both groups had similar risks of developing diabetes within 7.5 years (UC = 0.58; IC = 0.55) and had similar weight (UC = 191.2 lb; IC = 190.2 lb) and HbA1c levels (UC = 5.77%; IC = 5.76%).

Using intention-to-treat analysis, the participants in the IC group lost more weight than UC participants (−2.5 lbs, P = 0.004) and also had lower HbA1C levels (−0.10%, P = 0.009). Weight loss and HbA1C reduction were shown to be significantly correlated (r = 0.41, P < 0.001). Insulin resistance improved in the IC group and was correlated with weight change (median HOMA-IR = −0.36 in IC and −0.06 in UC; P = 0.03). At year 1, 5 participants in the UC group (3.7%) had developed diabetes compared with 2 in the IC group (1.4%), P = 0.32. There were few significant differences between the IC and UC groups in dietary intake. Participants in the IC group trended towards a greater reduction in percentage of calories from saturated fat (−0.65% vs. −0.43%; P = 0.08). There were no differences in physical activity or CES-D and SF-12 scores between the 2 groups.

Attendance in the groups was low (60% at the first session, dropping down to 20% at the last session, median of 6 group sessions attended). Feedback elicited from 77 participants noted contributing factors to resistance to change, including stress (34%), lack of willpower for dietary change (55%), time constraints (48%), and lack of motivation (29%).

Conclusion. A culturally tailored, community-based diabetes prevention intervention led to modest weight loss and reduction in HbA1C levels at 1 year in a low-income, Latino population at high risk for type 2 diabetes.

Commentary

The high prevalence of diabetes in Latinos compared with non-Hispanic whites [2] necessitates effective interventions that are culturally tailored and conducted with the appropriate language and literacy levels [3]. The DPP was a landmark study that demonstrated that an intensive 16-week lifestyle behavioral program can lead to a 58% reduction in the risk of diabetes at 3 years in high-risk participants [4]. The DPP investigators described the DPP as "flexible, culturally sensitive, and individualized," and DPP investigators achieved similar success in their Hispanic subgroups [5]. However the DPP is resource-intensive and may not achieve the same results in low-literacy, Spanish-speaking Latino populations. The LLDPP investigators demonstrated that a less intensive, innovative, tailored intervention based on the prin-

ciples of the DPP reduced weight and HbA1C levels in a low-income Latino population. Strengths of this study include that investigators partnered with the local community to design the study and recruit patients, leading to a decent sample size (n = 312), high retention rate of participants (94%), and lowered A1c and weight. However, reductions in weight loss were ultimately modest in comparison to the DPP.

Tailoring, or adapting interventions to specific individuals or populations, is important to address unique barriers to behavior change and has been shown to be successful in various communities [2,6,7]. In a study by Cramer et al, researchers found that a modified DPP tailored to a population of 45% "racial and ethnic minorities" led to greater reductions in HbA1c levels and weight [3]. In the LLDPP, researchers utilized qualitative methods and community–academic partnerships to ensure that the intervention reflected the needs of the local Latino community [8]. However, generalizability to other Latino communities is limited by the relative homogeneity of the sample, which was exclusively of Caribbean origin (Puerto Rican and Dominican). The LLDPP might need to be further tailored to account for differences in culture and food preference, which might make adoption in other Latino communities more cost and resource prohibitive.

Despite the rigorous tailoring methods, weight loss achieved by participants in the LLDPP was much lower than for Hispanic patients in the DPP and other translations of the DPP to the community. In the DPP, Hispanic men lost 7.5 kg and Hispanic women lost 5.8 kg at 1 year [4]. Also, in a rural, church-based study conducted with an African-American population, researchers found a mean weight loss of 7.9 lbs at 6 months and 10.6 lbs at 1 year using a tailored version of the DPP [9]. The low rate of participation in the groups (60% at the first session, dropping to 20% at the last session), while consistent with other studies of low-income populations [10], may be one reason why investigators achieved modest outcomes. Another reason for this may be that the LLDPP was less intensive than the DPP and cost significantly less ($661 vs. $1399 per participant) [5,11]. Even though the authors argue that the LLDPP achieved a cost savings, back of the envelope calculations demonstrate that the cost per kg of weight loss is roughly $250 in the DPP and $600 in the LLDPP. Thus, higher cost interventions in this high-risk population may be worthwhile if they lead to better outcomes.

Applications for Clinical Practice

A culturally tailored, group-based adaptation of the DPP leads to reductions in weight and HbA1C in a low-income Latino population at high risk for type 2 diabetes. Further investigation should explore how to achieve stronger outcomes in this population.

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