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Brief Report: Effects of Acculturation on a Culturally Adapted Diabetes Intervention for Latinas

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Abstract

Objective—To inform the refinement of a culturally adapted diabetes intervention, we evaluated acculturation's association with variables at several sequential steps: baseline measures of diet and physical activity, intervention engagement, putative mediators (problem solving and social resources), and outcomes (fat consumption and physical activity).

Method—Latina women ($N = 280$) recruited from health organizations were randomly assigned to a culturally adapted lifestyle intervention (!Viva Bien!) or usual care. A brief version of the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II) acculturation scales (Anglo and Latina orientations) was administered at baseline. Assessments at baseline, 6 months, and 12 months included social supportive resources for diet and exercise, problem solving, saturated fat consumption, and physical activity.

Results—Latina orientation was negatively related to saturated fat intake and physical activity at baseline. Latina orientation also was positively related to session attendance during months 6–12 of the intervention. Independent of 6-month intervention effects, Anglo orientation was significantly positively related to improvements in problem solving and dietary supportive resources. Anglo orientation related negatively to improved physical activity at 6 and 12 months. There were no acculturation-by-intervention interactions on putative mediators or outcomes.

Conclusions—The cultural-adaptation process was successful in creating an engaging and effective intervention for Latinas at all levels of acculturation. However, independent of intervention effects, acculturation was related to putative mediating variables (problem solving and social resources) and an outcome variable (physical activity), an indication of acculturation's general influence on lifestyle and coping factors.

Keywords

diabetes; culturally adapted intervention; Latinas; acculturation; multiple risk factors

Women of Hispanic heritage (“Latinas”) living in the U.S. have a prevalence of type 2 diabetes that is almost twice that found for non-Latina White women (National Center for Health Statistics, 2007) and have more disease complications (Narayan et al., 2008). To address this health disparity, there is a clear need for interventions to help Latinas make lifestyle changes that are effective in managing type 2 diabetes and in preventing complications that result from disease progression.

One approach to the development of treatment programs for at-risk subcultural groups is the cultural adaptation of evidence-based interventions (Castro, Barrera, & Holleran Streiker, 2010). Existing guidelines for cultural adaptations specify a deliberate, multi-phase process of literature review, qualitative research, and pilot study leading to a revised version of the original treatment, which then is subjected to a formal trial (Barrera & Castro, 2006). For the present study, an intervention (the Mediterranean Lifestyle Program) that showed efficacy with a sample of predominantly non-Latina White women (Toobert et al., 2007) was culturally adapted for Latinas (Osuna et al., 2011). One of the challenges facing cultural adaptations is the development of a modified intervention that is appropriate for the full spectrum of individuals comprising a subcultural group. The same concerns about cultural fit that motivated the cultural adaptation could be directed at the adaptation itself, particularly if the targeted subcultural group is extremely heterogeneous (Castro et al., 2010). Ideally, a culturally adapted intervention is equally appealing and effective for participants at all levels of acculturation.

A determination of how acculturation might influence the effectiveness of culturally adapted interventions should be a standard part of the adaptation process. Analyses are particularly critical for treatments that involve fundamental cultural elements such as foods, methods of food preparation, and physical activity norms. The purpose of the present study was to determine the effects of acculturation on all facets of the intervention process: (a) participants’ baseline saturated fat consumption and physical activity, (b) intervention engagement (e.g., session attendance, dropout), (c) intervention effects on putative behavior change mechanisms, and (d) the intervention effects on outcomes (Barrera & Castro, 2006). It was hypothesized that the adapted intervention (!Viva Bien!) would be effective at all levels of acculturation.

Method

Recruitment

Participants were recruited from nine Kaiser Permanente (KPCO) clinics in the Denver, Colorado metropolitan area, and one large community health center. All participants signed informed consent agreements. The Institutional Review Boards of the relevant institutions approved the research protocol.

A woman was eligible if she identified as Latina, was 30–75 years old, diagnosed with type 2 diabetes for at least 6 months, lived independently, had a telephone, was literate in either English or Spanish, and lived near the intervention site. Recruitment details have been described previously (Toobert et al., 2010). Participants were randomly assigned to a usual care control condition (n=138) or the culturally adapted intervention (!Viva Bien!) plus usual care (n=142).

Treatment Protocol

The !Viva Bien! program included a 2½-day retreat that introduced each of the major components of the program and provided time for participants to practice new skills. Participants were instructed to (a) follow the Mediterranean diet adapted for Latino cultures, (b) practice stress-management techniques daily, (c) engage in 30 minutes of daily physical

activity, (d) stop smoking, and (e) participate in problem-solving-based support groups. After the retreat, the intervention continued with 4-hour facilitator-led meetings, providing 1 hour each of instruction and practice in physical activity, stress management, diet, and support group sessions. Weekly meetings for 6 months were then faded to twice-monthly meetings for an additional 6 months. The cultural adaptation of the source intervention was detailed by Osuna et al. (2011) and was evaluated in a subsequent randomized controlled trial (Toobert et al., 2011).

Usual care consisted of management of complications associated with diabetes, monitoring of other health factors, and laboratory assays in compliance with the American Diabetes Association standards of care. A choice of one free Kaiser-Permanente class covering the areas targeted in !Viva Bien! was included as an enhancement to usual care.

Measures

Baseline assessments were conducted in two visits with randomization occurring at the second assessment. Follow-up assessments were at 6 and 12 months for all participants.

Body mass index (BMI)—Measures of height and weight were taken in the morning when participants were in the fasting state and standing in stocking feet.

Acculturation—The assessment of acculturation has its complexities and controversies (see Perez-Escamilla & Putnik, 2007). We assessed acculturation with the short form of the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II) scale (Cuéllar, Arnold, & Maldonado, 1995) that has two 6-item subscales, Anglo orientation and Latina orientation. They were scored so that high scores indicated high Latina orientation and high Anglo orientation. Subscales were correlated negatively, $r(278) = -.66, p < .001$.

Social resources for diet and physical activity—The brief Chronic Illness Resources Survey (CIRS) measures an individual's frequency of using social-ecological resources over the preceding 6 months (Glasgow, Toobert, Barrera, & Strycker, 2005). The present study focused exclusively on the two CIRS subscales specific to support for diet and exercise (Barrera, Strycker, MacKinnon, & Toobert, 2008).

Problem solving—Problem-solving ability was assessed using a survey version of the Diabetes Problem-Solving Interview (Glasgow, Toobert, Barrera, & Strycker, 2004).

Physical activity—The modified International Physical Activity Questionnaire (IPAQ) was used to calculate the number of days per week participants engaged in physical activity (Craig et al., 2003).

Saturated fat consumption—The semi-quantitative food frequency questionnaire (FFQ) was used to document percent of calories from saturated fat (Patterson et al., 1999).

Statistical Approach

Change scores were calculated for putative mediators and outcomes so that higher scores reflected greater improvement from baseline (Rogosa, 1988). The tests of treatment-by-acculturation interactions were conducted within the multiple regression framework recommended by Aiken and West (1991).

Results

Participants

A total of 280 Latina patients completed baseline assessments. Most participants were born in the United States (79.6%) or Mexico (15.8%). About 44% spoke little or no Spanish, and the remaining 56% reported using Spanish a moderate amount to almost always. About 10% spoke little or no English. Participants had a mean age of 57.11 years, had been diagnosed with diabetes for almost 10 years, and were obese (mean BMI = 34.3 kg/m²).

Baseline Associations

Correlations at baseline determined the relations between acculturation, saturated fat consumption, and physical activity prior to intervention. Latina orientation was negatively correlated with percent calories from saturated fat, $r(254) = -.203, p = .001$. Its relation with physical activity, $r(277) = -.116, p = .053$, approached significance. Anglo orientation correlated positively with support for exercise, $r(274) = .156, p = .01$. U.S.-born women consumed somewhat more saturated fat at baseline than foreign-born women, $r(254) = .147, p = .019$.

Engagement

Latina orientation had a small but significant relation with the percent of sessions attended from the 6- to 12-month intervention period, $r(127) = .188, p = .033$. Neither Latina orientation nor Anglo orientation scores was related to dropout at 6 months or 12 months.

Relation of Acculturation to Intervention Mechanisms and Outcomes

Regression models included the following predictors: age, baseline BMI, either the Latina or Anglo acculturation score, intervention condition, and the interaction of the acculturation score with intervention condition. Separate analyses were conducted for Latina and Anglo orientation on three dependent variables concerned with hypothesized treatment mechanisms (problem solving, supportive resources for exercise, and supportive resources for diet), and two behavioral outcome variables (physical activity and saturated fat consumption).

Statistically significant intervention effects were found for all five dependent variables at the 6-month assessment (also see Toobert et al., 2011). In addition, Anglo orientation had a significant positive relation to improvements in problem solving, $F(1, 192) = 4.22, p = .041, \Delta R^2 = .02$, and to improvements in dietary supportive resources, $F(1, 202) = 9.78, p = .002, \Delta R^2 = .042$. Anglo orientation was negatively related to improvements in physical activity at 6 months, $F(1, 205) = 4.33, p = .039, \Delta R^2 = .02$, and at 12 months, $F(1, 182) = 5.13, p = .025, \Delta R^2 = .026$. Latina orientation had a negative relation with improvements in dietary supportive resources, $F(1, 202) = 7.68, p = .006, \Delta R^2 = .034$.

There were no statistically significant acculturation-by-intervention interaction effects for putative mediators or outcomes at 6 or 12 months.

Discussion

Testing for possible interactions between intervention conditions and acculturation is a critical step in the evaluation of a culturally adapted intervention (Castro et al., 2010). The !Viva Bien! culturally adapted intervention was found to be effective for Latinas who varied along continua of acculturation levels. A challenge for investigators who conduct cultural adaptations is to create intervention procedures that are suitable for the considerable within-group variability that exists for subcultural groups (Castro et al., 2010). The cultural adaptation of !Viva Bien! appeared to achieve that goal. Null effects cannot be proven, but

the results gave no indication of intervention-by-acculturation interactions. The study had adequate power (.80) to detect a small interaction effect ($f^2 = .039$) even with the reduced sample size ($N=203$) for some analyses at the 6-month assessment (Faul, Erdfelder, Buchner, & Lang, 2009).

Also notable was that acculturation did not relate strongly to engagement. Acculturation was not associated with dropout, and Latina orientation showed only a small ($r = .188$) but statistically significant association with number of sessions attended during the second 6-month period of the study. Women with high Latina orientation were somewhat more likely to attend sessions than those with lower Latina orientation.

Acculturation affected 6-month changes in problem solving, social resources for dietary practices, and physical activity that were *independent* of intervention effects. Specifically, Anglo orientation was positively associated with improvements in problem solving and social resources for dietary practices; it was negatively associated with improvements in physical activity. Latina orientation was related negatively with improvements in dietary support. Because acculturation's effects were independent of treatment, they suggest a naturalistic effect that transpired over the first 6 months of the study for Latinas in both intervention and control conditions. English language facility might have assisted women in using information from media or health providers about problem solving and social support for dietary practices.

Our results at baseline were similar to studies with general community samples that showed acculturation's relations to fat consumption (Bermudez, Falcon, & Tucker, 2000) and physical activity (Ghaddar, Brown, Pagan, & Diaz, 2010). It was interesting that a relatively strong Latina orientation was associated with both lower saturated fat intake (a protective factor) and less physical activity (a risk factor). Such contrasting findings serve as a reminder that there are no simple answers to the question of whether acculturation is good or bad for Latinas' health.

Limitations included the use of a brief acculturation scale that emphasized language use and the restricted number of women who were high on Latina orientation. Future research on health disparities might consider the approach used in the present study, beginning with an efficacious intervention, culturally adapting it through a systematic approach, and then evaluating its ability to engage and change the behavior of participants who vary on dimensions of acculturation.

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