REVIEW: WEIGHT-LOSS INTERVENTIONS WITH HISPANIC POPULATIONS

Objective: To conduct a review of published studies that have addressed the effectiveness of weight-loss interventions for Hispanic individuals in the United States, identify key components of effective interventions for this population, and provide a set of recommendations for the development of effective treatment programs.

Data Source: Online bibliographic databases were searched from 1980 to September 2006.

Study Inclusion/Exclusion Criteria: Two key search dimensions (''Latino'' or ''Mexican-American'' or ''Hispanic'' or ''Spanish-speaker''; and ''weight-loss'' or ''weight-reduction'' or ''obesity treatment'' or ''diet intervention'') were used to search for articles.

Data Extraction: The methods and findings of all retrieved articles were evaluated, and summary outcome data were taken from published results.

Data Synthesis: The limited number of published articles found, and the lack of identifying information on key variables (eg, manner in which subjects were determined to be ''Hispanic,'' level of acculturation, socioeconomic status [SES], number of years living in the United States, country of origin, etc) precluded conducting a formal meta-analysis on the available outcome data.

Results: The review identified only three controlled intervention studies specifically targeting Hispanic populations for weight-loss; most of the available studies were not randomized and did not assess key variables, such as acculturation, type of community of origin, level of education, etc. Most available ''culturally sensitive'' health-related interventions targeting Hispanic populations do not specify what made the interventions ''culturally sensitive'' beyond the translation of the materials into Spanish.

Conclusions: Traditional weight-loss interventions developed for use on Anglo-American subjects do not appear to have been effective for Hispanic individuals. There is an urgent need to both develop effective interventions and to improve the methodologic thoroughness in the design, implementation, and reporting of such interventions for this population. (*Ethn Dis*. 2007;17:397–402)

Key Words: Hispanics, Obesity, Weight-Loss Interventions

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INTRODUCTION

The deleterious effects of obesity on health have been well documented. Obesity increases overall mortality,[1–3] decreases life expectancy,[4] is an important risk factor for cardiovascular disease and diabetes,[5–7] and greatly increases healthcare costs.[8] Approximately two thirds of all American adults are overweight, and one third are obese.[9]

OBESITY IN ETHNIC MINORITY POPULATIONS

Epidemiologic studies show a steep, inverse relationship between socioeconomic status (SES) and obesity rates in the United States;[10–12] lower SES individuals are 50% more likely to be obese.[13] Obesity affects ethnic minority communities at disproportionately high levels,[14–17] and Hispanics are among the ethnic groups most at risk for obesity and its consequences. Even controlling for socioeconomic factors, Hispanics in the United States are at higher risk for overweight and obesity[18,19] and tend to develop obesity at earlier ages than non-Hispanics.[11,20–22] Among Mexican American women, the prevalence of obesity stands at 40% (compared to 30% for European American women), having increased >7% over a five-year period.[23] Diabetes that results from overweight is a particularly severe problem in the Hispanic population, with a prevalence that is approximately twice that of European Americans; the prevalence of diabetes-associated complications, such as retinopathy and amputations, among Hispanics is estimated to be 50%–100% higher than among European Americans.[24] Hispanics are at significant risk for a clustering of cardiovascular risk factors;[25] they are predisposed to developing atherogenic patterns of body fat distribution[26,27] associated with high blood pressure, heart disease, diabetes, and increased cancer risk.[28]

ACCULTURATION AND OBESITY

While recent Hispanic immigrants are generally healthier than the US-born population, the prevalence of poor health behaviors, including the adoption of high-fat, low-fiber diets,[29] increases with length of residence. This behavior change among immigrants is explained by acculturation, a term that refers to

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behavior or attitude changes in a group that result from continuous interaction with individuals from a different culture.[30] The acculturative model predicts that when Hispanics migrate to American cities from agricultural societies with high levels of physical activity and limited access to processed foods, their dietary and physical activity levels will gradually change to reflect the practices of mainstream American society. This model has been supported by studies that show that number of years living in the United States is the strongest correlate of obesity among Hispanic migrant workers.[31] A linear association appears to exist between obesity and Hispanics' length of residence in the United States; immigrants with >15 years of residence have a nearly four-fold greater risk of obesity than those with less than five years of residence.[29] Acculturation is an important variable that must be addressed in designing, implementing, and assessing weight-loss interventions for Hispanic individuals.

EXPERIENCE OF HISPANICS IN WEIGHT LOSS PROGRAMS

Ethnic minorities tend to be less successful than European Americans in most available weight-loss programs.[32] They encounter more barriers to diet self-care,[33–35] attend fewer intervention sessions,[36] and are less likely to exercise.[37]

For the present review, two key dimensions (''Latino/Hispanic/Mexican American'' and ''obesity/overweight prevention/control/treatment/intervention'') were used to search for articles in online bibliographic databases from 1980 to September 2006. The search produced only three studies, summarized in Table 1. An early study that targeted Hispanic women[38] consisted of an 11-week intervention conducted in Spanish by a Hispanic dietitian. This intervention included translation of dietary advice materials into Spanish, adding ''appropriate ethnic foods and recipes,'' ''stressing the importance of health for the entire family,'' and ''reformatting some materials.'' No information was provided on how participants were determined to be Hispanic; their level of acculturation, country of origin, and length of residence in the United States were not reported, and no information was provided as to how the reformatting changes were determined to increase the ''ethnic sensitivity and appropriateness'' of the intervention. Attrition was a significant problem; 24 (45%) of 44participants did not complete the program. Nevertheless, for participants

Table 1. Weight-loss interventions specifically targeting Hispanics

Study	Design	Population	Results	Limitations
Dommel, Alford, Cattlett, Rodriguez, Gench[38]	Control (n=20) vs experimental (n=14) group; 11 week duration	Spanish-speaking females	Mean weight loss of 8.7 lbs.	No information on randomization, session duration, program content, acculturation, SES. >50% attrition
Avila, Hovell[41]	Repeated measures control (n=22) vs experimental (n=22) group; eight 1-hr weekly sessions involving exercise, nutrition education, behavior modification	Females self-described as ''Latino''	Significant BMI reductions post-test and at three-month followup	Follow-up data available for only 10 participants in treatment group; sample not representative of Hispanic population
Foreyt, Ramirez, Cousins[39]	Repeated measures, randomized study comparing manual-only (n=27), individual treatment (n=32), family treatment (n=27). 24 weekly sessions: nutrition, exercise, behavioral instruction, food demonstrations	Bicultural sample of females self-identified as Mexican American	Modest weight loss, family intervention more effective and resistant to weight regain	High attrition rates
The Diabetes Prevention Program Research Group[42]	Multicenter randomized clinical trial. 16-session core curriculum, behavior modification, nutrition information, exercise. Compared placebo (n=168) against pharmacologic intervention (n=162) and lifestyle intervention (n=178)	Hispanic sample consisted of 508 adults, with BMI>24	48% of Hispanic sample achieved 7% weight-loss goal at the end of core curriculum	No information on acculturation, country of origin

SES=socioeconomic status, BMI=body mass index.

who provided follow-up data immediately after the intervention, the study found a mean weight loss of 8.7 lbs, with an additional 1–lb weight loss three weeks after the final session.

A second study[39,40] assessed a family- vs individual-oriented approach in a culturally adapted weight-reduction program for self-identified Mexican American women and contrasted both of those approaches with a manual-only control group. Both intervention groups attended 24 weekly sessions that included nutrition instruction, food demonstrations, and instruction in behavioral health strategies. The family intervention differed from the individual approach in that the manual included information on partner support and parenting skills to encourage family changes in eating and exercise. The participants' spouses were encouraged to attend, and separate classes were conducted for participants' preschool-aged children. At post-test, data were reported for 86 (51%) of the original 168 participants and showed both intervention groups had achieved more weight loss than the manual-only control group, with no differences found between the individual vs family approaches. The obtained mean weight loss was modest; participants in the family intervention lost an average of 6.6 and 9.9 lbs and those in the individual group lost an average of 5.7 and 7.2 lbs after three and six months of treatment, respectively.

A third randomized study[41] examined the effectiveness of a 10-week physical-activity training intervention for weight loss among Hispanic women. The intervention involved instruction in self-change behavior modification strategies, nutritional education, a buddy system, and exercise. At the end of the intervention, although no differences were found in body weight, women in the treatment group ($n=22$) had achieved significant reductions in body mass index (BMI), waist-to-hip ratio, and total serum cholesterol, compared to controls. At three months post-treatment, with available data for only eight controls and 10 participants, hip ratio and total cholesterol level had returned to baseline for both groups, but the intervention group showed an additional reduction of 1.3 kg/m^2 on BMI.

One additional study, the Diabetes Prevention Program[42,43] was included in our review because, while not specifically targeting weight loss among Hispanic individuals, it involved one of the largest available samples of Hispanic participants ($n=508$), and efforts were made to address the specific needs of this ethnic group. For example, Hispanic case managers tailored the intervention to meet the needs of their local participants, the core curriculum was available in Spanish and English, lesson handouts included information about types of foods and cooking methods often used by Hispanics, and individual centers had the flexibility to select group classes and materials most appropriate for their Hispanic participants. The program consisted of participants who met individually with their case managers 16 times over the first six months of the program and completed a core curriculum of basic skills related to nutrition, exercise, and behavior change and subsequent followup individual or group meetings every two months. Participants had dual goals of achieving at least 150 minutes/week of physical activity and losing 7% of their baseline body weight. Hispanic participants were significantly more successful at achieving the exercise goal at the end of the core curriculum and at followup but significantly less successful than Caucasians at achieving the weight goal at the end of the intervention.[42,43]

Given the paucity of published intervention studies specifically targeting Hispanic individuals for weight loss, our search was widened to include other related interventions (ie, nutrition education/dietary change and physical exercise interventions). These new dimensions yielded seven additional studies, which were grouped in three categories: interventions to increase physical activity ($n=1$), interventions designed to prevent heart disease or cancer through diet change ($n=4$), and nutrition-focused interventions for diabetes self-management ($n=2$). Table 2 shows a summary of these studies.

Only one study was specifically designed to improve physical activity among women who self-identified as Mexican American, and no information was available regarding acculturation[44]; this randomized, prospective, block-design, six-month intervention combined behavioral techniques and brisk walking and offered unspecified ''culturally tailored rationales for diet'' as well as ''modification of native diets,'' with instruction provided by bilingual materials and instructors. The study found no differences in activity levels between the groups.

Our search yielded four intervention studies aimed at reducing cardiovascular and cancer risk among Hispanics through nutrition education and exercise. An early randomized study[45] consisted of a weekly intervention involving Mexican American families (with no available information as to acculturation or how families were determined to be Mexican American) with separate educational segments for children and adult participants, physical exercise classes, and a healthy snack or recipe shared by participants. At the end of the intervention, Anglo and Mexican American families reported more knowledge regarding health and nutrition, but Anglo-American families showed significantly more dietary change behavior. A second study developed and evaluated a ''culturally sensitive'' diet program to reduce cholesterol in Mexican American patients with systemic lupus[46]; while the intervention was reported to be successful by participants' self-report, the study was limited by lack of a control group and its small sample size ($n=2$). A third study[47] assessed the effectiveness of a nutrition intervention in a large group ($n=526$) of Hispanic individuals who attended English-as-a-second-language classes. The intervention was effective, with significant reductions in total cholesterol and blood pressure and higher fat avoidance and nutrition knowledge in the intervention group. No information was obtained about the participants' countries of origin or

Table 2. Interventions targeting Hispanics, not specific to weight loss

Study	Design	Population	Results	Limitations
I. Interventions to increase physical activity				
Poston, Haddock, Suminski, Olvera[44] (2001)	Randomized, prospective block design comparing treatment (n=134) vs wait list (n=135) groups. Six months of weekly 90-minute sessions combining behavioral techniques and exercise. Materials provided in Spanish and English, offered ''modification of native diets'' and ''culturally tailored rationales for diet.''	Women of Mexican American descent	No differences between treatment and control groups in physical activity at 6 or 12 months	No information on acculturation or length of residence
II. Interventions for heart disease prevention through diet change				
Nader, Sallis, Patterson, et al[45]	Randomized behavioral intervention. Three months of weekly sessions, followed by nine months of monthly/bimonthly maintenance sessions. Intervention involved exercise, separate child and adult education sessions, problem-solving sessions, behavioral management	Mexican American and Anglo American families matched for SES of neighborhoods	Intervention resulted in increased nutritional knowledge for both groups, but Mexican American families showed less dietary changes	No information as to how families were determined to be Mexican-American, no acculturation information
Shah, Coyle, Kavanaugh, Adams-Huet, Lipsky[46]	Assessed acceptance of a ''culturally sensitive'' cholesterol-lowering diet program tailored for Mexican Americans with lupus	Compared two Mexican American with two African American lupus patients	Patients ''very satisfied,'' and near meeting diet goals after 6 and 12 weeks.	Small sample size, not randomized, no information as to recruitment, acculturation, all self-reported outcome data
Elder, Candelaria, Woodroof, Criqui, Talavera, Rupp[47]	Two-group repeated measures design. Intervention sought to increase nutrition-related knowledge and behaviors, compared to a control group taught stress-management	817 ESL students in the San Diego, Calif area, 732 of whom self-identified as Latino	Successful in reducing total cholesterol, blood pressure, increasing fat avoidance	No information on, or control of, SES, acculturation
Elder, Ayala, Campbell, Arredondo, et al[48]	Three-group randomized study comparing effectiveness of: 1) personalized training using lay health advisors and tailored printed materials; 2) tailored printed materials; and 3) off-the-shelf materials targeting Latinos to reduce dietary fat and increase dietary fiber	357 female participants with Spanish as preferred language	Combination of lay health advisors and tailored printed materials associated with less consumption of fat, fructose at post-test. Effects did not persist at 12-month followup	Latina participants identified by random dialing of ''Hispanic surname'' of phone listings
III. Nutrition-focused intervention for diabetes self-management				
Vazquez, Millen, Bissett et al[50]	Randomized controlled compared intervention (n=16) and control (n=20). 12-week education program on diabetes risk, fat and cholesterol, portion control, weight reduction, stress management	38 adults, both parents were of Caribbean Latino origin.	Post-intervention, treatment group reduced total fat intake, increased dietary carbohydrate and fiber	No follow-up data, small sample size
Brown, Harris[49] (1999)	Starr County Study of diabetes education. Longitudinal randomized to ''integrate cultural values'' in health-promoting strategies for Mexican Americans with diabetes	247 adults from the Mexico-US border area of Starr County	Intervention successful in diabetes knowledge, weight change, fasting glucose	

SES=socioeconomic status; ESL=English as a second language.

level of acculturation, and the authors note the difficulty in generalizing the results to other Hispanic populations of differing SES, national origins, or acculturative levels.

A fourth study compared three behavior-change approaches to reduce dietary fat and increase fiber consumption among a large group (n=357) of Hispanic women.[48] Two personalized approaches consisted of tailored printed materials alone or in combination with counseling by lay health workers (*promotoras*) and were compared to ''off the shelf'' materials that targeted Spanish-speaking Hispanics. While immediately after the intervention, the *promotora* group significantly outperformed the other groups in total fat, saturated fat,

energy, and fructose intake, the effects did not persist at 12 months post-intervention. The study was noteworthy in its use of focus groups to develop the intervention curriculum and its relatively low attrition rate (21%).

Finally, our search yielded two nutrition-focused interventions for diabetes self-management; one of them, the Starr County Border Health Initiative,[49] has generated several published reports. This prospective, randomized, culturally sensitive study involved Mexican American individuals with type 2 diabetes along the Mexico-Texas border and has been effective in decreasing hemoglobin A1C and fasting blood glucose levels and increasing diabetes knowledge among participants. The other published intervention study targeted Hispanic diabetic patients from Cuba, the Dominican Republic, or Puerto Rico and developed a diabetes-management intervention by using surveys and focus groups.[50] Immediately after the intervention, the study reported successful reductions in total and saturated fat intake and increased fiber and carbohydrates in the intervention group, but no follow-up data were ever published.

In summary, few weight-loss or nutrition/exercise behavior change interventions have targeted Hispanic populations. Most of the available studies are limited by lack of a control group and lack information on the manner in which subjects were determined to be Hispanic, level of acculturation, education, SES, subjects' countries of origin, language spoken at home, and time living in the United States. In most cases, information regarding how the interventions were made "culturally sensitive" is not provided, although the term often appears to mean that materials used to treat the general population were translated into Spanish. The lack of this information not only makes it difficult to compare interventions in a meaningful way, but it also suggests the need to incorporate standardized measures (eg, acculturation measures) and to obtain specific demographic information (eg, country/community of origin, level of education) in any future interventions that target this population. We know that "Hispanics," not an easily defined term, engage in risky behaviors to achieve weight loss, ie, vomiting, using laxatives, diuretics, and diet pills,[51] and that, with the possible exception of pharmacologic treatments[52] and some specific interventions (ie, the Diabetes Prevention Program), weight loss interventions designed for the general population, including surgical interventions, tend to be less successful for Hispanics.[53] Researchers who develop weight-loss interventions for this population must acknowledge the enormous diversity of the Hispanic population in the United States, not only in terms of their different national origins and cultural backgrounds but also communities of origin (ie, agricultural vs industrial), literacy level, and SES.

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