

Outcome Measures of a Family-Based Education Approach with Mexican Immigrants in the Yakima Valley

Virginia A. Bennett, Carissa Sundsmo-Switzer

Department of Nutrition, Exercise & Health Sciences, Central Washington University, Washington, USA.

Email: bennettv@cwu.edu

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With the continued incidence of obesity and health related issues in the United States and especially in the Hispanic population, it is important to provide useful healthy lifestyle education to this population. One of the barriers to providing this information is the lack of culture sensitivity in the content and presentation of current programs. In this pilot study, pre and post tests were used to measure the effectiveness of Salsa, Sabor, y Salud, a culturally sensitive program designed for Latinos. Outcome measures included dietary changes, weight, body mass index, waist circumference, blood pressure, heart rate, reported physical activity, and healthy lifestyle score. Diet was evaluated by 24-hour diet recall for both adults and children. Difference in outcome measures was assessed using a dependent *t* test. Significant decreases in weight, waist circumference, diastolic blood pressure, kilocalories, and grams of carbohydrates were observed. Adults reported an increase in total minutes of physical activity and the importance of living a healthy lifestyle. This culturally sensitive education program, Salsa, Sabor, y Salud, has a positive effect on health related outcome measures.

Keywords: Cultural Sensitivity, Mexican Immigrants, Salsa Sabor y Salud

Introduction

With the continued increase of overweight and obesity in the United States and especially in the Hispanic population (Ogden, Carrol, Curtin, McDowell, Tabak, & Flegal, 2006; Flegal, Ogden, & Carroll, 2004), it is important to provide useful healthy lifestyle education. One of the barriers to providing this information is the lack of culture sensitivity in the content and presentation of current programs. The Salsa, Sabor, y Salud program has broken the barrier and offers a culturally sensitive program to the Hispanic population on healthy lifestyle choices. However, at this time the only evaluation of the program that has been completed is a participant self assessment and satisfaction survey. Although knowledge is an important component to making healthy lifestyle changes, it does not always result in participant compliance. More objective data are necessary to measure the outcomes of an educational program. The purpose of this pilot study was to gather and analysis objective data.

Implications of Ethnicity

According to the 2010 Behavioral Risk Factor Surveillance System, 36.3% of all adults are overweight and 27.60% are obese in the United States (CDC, 2010). When ethnicity is factored in, a disproportionate number are either Hispanic or non-Hispanic blacks. In 2007, Wang and Beydoun reported a higher prevalence of overweight and obesity in the adult Hispanic population when compared to the adult non-Hispanic white population, 63.6% and 54.8% respectively. (Wang & Beydoun, 2007). The higher percent of Hispanics with unhealthy weight is further complicated by the increased number of Hispanics without health insurance (Doty, 2003). Even with the extensive research and knowledge of the nutritional and physical activity issues necessary to maintain a healthy life style, there continues to be the challenge of providing effective health education and incorporating it into culturally sensitive

programs. Several successful culturally sensitive education programs that target Hispanic minorities focus on diabetes (Mauldon, Melkus, & Cagganello, 2006; Brown, Kouzehananie, Garcia, & Hanis, 2002; Gilmer, Philis-Tsimikas, & Walker, 2005). However, with the rise of obesity and related diseases in our nation, health care has increased its focus on preventive medicine. Kraft in partnership with the National Latino Children's Institute has developed Salsa, Sabor y Salud (SSS), a healthy lifestyle program that incorporates Latino traditions to educate families with children under the age of 12 (Barrera, et al., 2002). Two evaluation studies have been conducted to measure participants' knowledge, attitudes and behaviors regarding a healthy lifestyle. Both of these evaluations had positive results (Center for Prevention Research and Development, 2005; Huang, et al., 2008). To date, however there have been no studies that have measured objective outcomes of this program.

Program Design

The SSS program was created through the collaboration of the National Latino Children's Institute and Kraft Foods. The program was designed to teach healthy lifestyle choices utilizing the traditions of Latino family gatherings. The curriculum provides 12 hours of instructional and activity time that can easily be adjusted to meet the needs of the organization or group providing the classes. Each session has a theme that educates families on a component of nutrition and physical activity. Themes include: 1) family reunions; 2) ideal pair (beans and rice); 3) mid-day breaks and snacks; 4) seeds from the Americas; 5) the harvest; 6) salsa y sabor; 7) at the park and, 8) the celebration. All classes include both healthy eating education and a physical activity component. During each session the educational component of the class is broken into three age groups; adults, 8 - 12 year olds and 3 - 7 year olds. The theme being addressed is the same for each group, but provided at the

appropriate learning level for each age group. Following the educational component, families come together in one room to share information and participate in a physical activity or 'play time'. All materials for the program are provided in both English and Spanish to meet the needs of the particular group being instructed. There is also an emphasis on ethnic pride and heritage that is woven through-out the sessions. Developers of the SSS program speculate that this program design is better suited for a family-based culture.

Methodological Design/Data Analysis of Participants

Study Population

- Participants were previously enrolled with La Casa Hogar, a local community organization dedicated to providing resources to Mexican immigrant women and children, in Yakima, Washington. This population served as a sample of convenience for this pilot study. During quarterly registration for classes at La Casa Hogar, participants were provided flyers with information about SSS. Those who were interested in taking the class were enrolled.
- Sixteen adult female participants enrolled for the spring quarter class and seven adult female participants enrolled in the summer quarter class. Of these, twelve were included in the study. Participants who had missing data or dropped out of the class were not included in the study.
- For this study, only adult data were used. Children participated in the classes but data are not included in this paper.

Study Design

- The Central Washington University Institutional Research Board approved the study protocol and all participants were provided written informed consent. All explanations and materials were provided in both Spanish and English. If an individual refused to take part in the study, they were still allowed to participate in the SSS program.
- Classes were taught in Spanish by bilingual and bicultural faculty of La Casa Hogar who were trained to teach the class from one of the principal researchers who attended a national training conference for the SSS program. At every class, two Registered Dietitians and two bilingual undergraduate Nutrition and Dietetic students from Central Washington University were in attendance to answer any questions that were related to nutrition and activity and were outside of the scope of the instructor. Subjects acted as their own control with pre and post measurements taken for each participant. All data were collected prior to the first class and one week following the last class.

Outcome Measures

Pre and post testing was used to assess changes in nutrition

and physical activity as a result of the SSS program using the following tools.

Anthropometric. Height was recorded to the nearest quarter of an inch. Weight was measured using a balance scale (Continental Scale Corp Health o Meter Model Number 400 G2L). Waist circumference was measured using a Dean flexible non-stretch retractable measuring tape. Body Mass Index (BMI) was calculated as body weight in kg/ height in m².

Blood Pressure. Systolic and diastolic blood pressure was measured with an automatic digital blood pressure monitor (Omron Model: HEM-725C). Instructions provided by the manufacturer of the blood pressure monitor were followed.

Nutritional Assessment. Diet was assessed using 24-hour dietary recall recorded by trained bi-lingual Nutrition and Dietetic University students. Three dimensional food models were used to demonstrate and determine serving sizes. Information of all foods and beverages consumed during the 24 hours proceeding the day of the interview from midnight to midnight were recorded.

Nutrient Estimation. Mean values for macronutrients and servings from each food group were assessed using Food Processor for Windows (Version 7.9, 2002, ESHA Research, Salem, OR). Percent kilocalories from the macronutrients were calculated.

Healthy Lifestyle Knowledge. A pre-and post-test derived from the National Latino Children's Institute was used to assess knowledge, beliefs, and attitudes of nutrition and physical activity (Barrera, et al., 2002). All questions were answered using a 5-point Likert scale; 1 meaning strongly disagree through 5 meaning strongly agree.

All participants that were included in the sample had to complete both the pre measurements and post measurements.

Statistical Analysis

Data were analyzed using SPSS 16.0 for Windows (version 16.0, SPSS Inc., Chicago, IL). Mean weight, BMI, systolic blood pressure, diastolic blood pressure, resting heart rate, macronutrients, percent kilocalories from macronutrients, and servings of each food group were compared with dependent *t* test. Statistical significance was set at $P < 0.05$.

Results

Anthropometric Data. Table 1 shows the mean pre and post anthropometric measures. Mean weight decreased by 1.27 kg ($P = 0.005$) and mean waist circumference decreased by 3.23 cm ($P = 0.004$). A decreasing trend in BMI was also observed ($P = 0.053$). One participant's waist circumference was not included in the analysis because of missing data.

Physical Activity, Blood Pressure, and Heart Rate. Diastolic

Table 1.
Baseline and post-intervention anthropometric measures.

Variable	n	Baseline	Post-intervention	P value
Weight (kg)	12	72.81 ± 4.04	71.72 ± 4.04	.005*
Body mass index ^a	12	30.25 ± 1.49	29.75 ± 1.48	.053
Waist circumference (cm)	11	91.49 ± 3.63	88.26 ± 3.45	.004*
Systolic blood pressure	12	115.33 ± 4.63	100.08 ± 9.62	.110
Diastolic blood pressure	12	72.25 ± 3.12	65.58 ± 2.74	.008*

^aCalculated as kg/m²; * $P < 0.05$.

blood pressure decreased significantly ($P = 0.008$). Positive but insignificant changes were also observed in a decrease in systolic blood pressure. Although participants increased the number of minutes spent doing physical activity by 43 minutes per week, the increase was not found to be significant, nor were there any changes in resting heart rate.

Macronutrients. Kilocalories and grams of carbohydrates consumed were significantly lower after SSS ($P = 0.012$, and 0.019 , respectively). There was a decreasing trend in the consumption of grams of fat and saturated fat ($P = 0.053$ and 0.060 , respectively).

Servings per Food Group. There was a significant decrease in the number of servings consumed from grains and milk ($P = 0.035$ and 0.045 , respectively). The mean servings of fruits and vegetables consumed increased while consumption of fats and sugars decreased. However, these changes were not significant.

Servings per Food Group. There was a significant decrease in the number of servings consumed from grains.

Healthy Lifestyle Knowledge. Using a 5-point Likert scale, participants reported an increase in making it a point to eat more healthy foods ($P = 0.026$). Participants' belief that eating and physical activity habits have a huge impact on the health of their body also increased, with 100% of participants rating this statement as a 5 on the post test Likert scale ($P = 0.039$).

Implications of the Study

For a group of minorities with a high prevalence rate of diabetes and a high rate of being uninsured, it is especially important to provide culturally sensitive lifestyle education as a means of prevention. Approximately 40% of Hispanics are uninsured, compared to 25% of African Americans and 14% of non-Hispanic whites (Doty, 2003). Hispanics have a lifetime risk of 45.4% for males and 52.5% for females of developing diabetes (Venkat Narayan, Boyle, Thompson, Sorensen, & Williamson, 2003). Hispanics are also less likely to seek medical care or follow medical instructions due to not fully understanding their doctors (Doty, 2003). This communication barrier may be due to Spanish-English translation, understanding written information, or cultural barriers between patients and medical staff (Doty, 2003). For this reason, culturally sensitive education programs are extremely important in this minority group. Other culturally sensitive education programs that target Hispanic populations have focused on improving diabetes control and have been successful in decreasing fasting blood glucose, hemoglobin A1C, and cholesterol levels (Mauldon, Melkus, & Cagganello, 2006; Brown, Kouzehananie, Garcia, & Hanis, 2002; Gilmer, Philis-Tsimikas, & Walker, 2005). This study evaluated SSS, a culturally sensitive education program designed to prevent adverse health outcomes, using both objective and subjective tools.

The rate of obese adult participants in this study exceeded the rates for Hispanics from the 2008 Behavioral Risk Factor Surveillance System in Washington State (CDC, 2010). Fifty percent of adult participants were obese and 33% were overweight at the beginning of the class. Adult participants' mean BMI decreased from obese to overweight status. A BMI greater than 30 is one measure of obesity which is related to many adverse health conditions including gallbladder disease, high blood pressure, high cholesterol, asthma, arthritis and diabetes (Mokad, et al., 2003; Must, Spadano, Coakley, Field, Colditz, & Dietz, 1999). Although not within the recommended BMI of 19.9 - 24.9, the participants decrease in BMI indicates improvement in

the weight status.

BMI alone is not always an indicator of health risks if an individual has a higher percent of lean body mass. However, when a BMI exceeds 30 and a waist circumference exceeds 40 inches for males and 35 inches for females, there is a strong correlation of high percent of body fat. Abdominal fat is an indicator of central obesity and is associated with mortality related to excess body fat (Biggard, et al., 2005). In the current study, 45% of subjects had a waist circumference greater than 35 inches, decreasing to only 36% after SSS. These results coupled with the significant decrease in weight are particularly impressive as the program's intention was not weight loss but to focus on a healthy lifestyle.

Blood pressure and heart rate were within normal limits prior to the study and therefore little change was expected. Although blood pressure and heart rate did decrease after the program, only diastolic blood pressure was significantly lower. SSS encourages physical activity by involving the entire family with physical activities such as walking, playing with a parachute, making an obstacle course, etc. Although these activities involve getting up and moving, they may not be as high of an intensity as running or riding a bike and therefore may not result in as drastic a change in blood pressure and heart rate as other more intense physical activities.

The Latina participants in a prior study stated that it would be easier for them to increase their physical activity if a facility provided child care for them and if there was a class for them to gain more knowledge regarding physical activity (Wilbur, Chandler, Dancy, & Lee, 2003). SSS provided education regarding physical activity to participants and child care was provided during this time. The fact that the physical activities used in this program were able to be completed while indoors or outdoors at La Casa Hogar, demonstrated that a gym is not needed in order to be physically active. It also allowed for women to learn and apply physical activities that involved their children and could be used as exercise for themselves. When compared to Caucasian populations, Mexican American women have higher levels of physical inactivity (Crespo, Smit, Anderson, Carter-Pokras, & Ainsworth, 2000; Crespo, Keteyian, Heath, & Sempos, 1996; Slattery, et al., 2006). However, only 20% of Mexican American women meet the recommend 30 minutes of exercise 3 or more times per week (Mier, Ory, Dongling, Wang, & Furdine, 2007). Participants in the current study averaged 26 minutes 3 times per a week prior to the intervention. Average minutes spent doing physical activity increased to 35 minutes 3.75 days a week, which meets recommendations for weekly physical activity.

Studies of diets among Hispanic populations have shown that average caloric intake varies between 1600 and 2400 kilocalories (Bermudez, Falcon, & Tucker, 2000; Loria, et al., 1995; Guendelman & Abrams, 1995; CDC, 2010). The participants in this study had lower total caloric consumption when compared to other studies. Average caloric intake decreased over the course of the program as well as total grams from all macronutrients.

Percentage of kilocalories from carbohydrates and protein increased. Percentage kilocalories from saturated fat decreased, to less than 7% of kilocalories, which meets the recommendations of the American Heart Association (AHA) (Guendelman & Abrams, 1995). The women in this study were first generation immigrants. Studies of acculturation effect on dietary consumption have shown that less acculturated minorities have healthier eating habits than more acculturated (Guendelman & Abrams, 1995; Neuhaus, Thompson, Coronado, & Solomon,

2004). Previous studies on Mexican American women born in Mexico found a lower percentage of kilocalories from fat and saturated fat when compared to U.S. born Mexican Americans, but still exceeded the AHA recommendations (Dixon, Sundquist, & Winkleby, 2000; Loria, et al., 1995; Lichtenstein, et al., 2006). It is important to maintain or improve dietary habits of first generation immigrants before diets become westernized. In this study improvement of dietary habits was accomplished with the use of a culturally sensitive education program.

When servings of food groups were examined, a decrease in both dairy products and grains was observed. Upon review of the diet recalls, it was noted that the number of corn tortillas consumed decreased as well as the serving size of milk. The SSS class emphasizes portion control and balance in meals using a plate model. Although the plate model used in the class encourages milk to be consumed with meals, the participants in this study elected to decrease their serving size. This was unexpected and will be addressed in future education sessions provided by these researchers. Corn tortillas are a popular source of calcium among Hispanic groups (Block, Norris, Mandel, & DiSogra, 1995). Although the decreased consumption of corn tortillas is a positive result for portion control at meals, corn tortillas and milk are among the top five sources of calcium for Hispanics (Block, Norris, Mandel, & DiSogra, 1995). If Hispanics are to decrease the number of corn tortillas they consume daily, it is important that they replace the lost source of calcium with another source to ensure the recommended daily allowance of calcium is met.

A positive result in the increase of fruits and vegetables was observed. Total fruit and vegetable consumption met the recommended 5 servings a day after the SSS class. A previous study found that Mexican Americans in the Yakima Valley of Washington state, where this current study also took place, consumed an average of 4.96 servings of fruits and vegetables per day (Neuhouser, Thompson, Coronado, & Solomon, 2004). In comparison, the participants in this study consumed fewer servings of fruit and vegetables prior to the class but increased to 6.26 servings per day after SSS.

Following SSS, participants better recognized the importance of eating healthy foods and being physically active, as measured by the Healthy Lifestyle test. This may indicate that a healthy lifestyles class that is culturally sensitive has a positive effect on participant's cognitive thinking regarding living a healthy lifestyle.

The current pilot study demonstrated that Mexican immigrants who participated in the class had positive outcomes of improved healthy lifestyle choices based on both objective and subjective testing methods. There are some limitations in the current study which include a small sample size, the possibility of the 24-hour diet recall being biased, and the classes not being offered throughout the year. The current study was held during the spring and summer months, allowing for more fruits and vegetables to be available at lower cost and more chances of nice weather for participants to play outside. Although the class does address physical activities that can be conducted indoors, it is recommended by the researchers that the class be repeated during the fall and winter to observe if seasonality has an effect on the outcome.

The increasing obesity rates and lower insurance rates of the Hispanic population make this an area of immediate concern for health educators. Therefore, it is important that programs designed to meet their cultural needs are made available. This study evaluated one such program and found it to have a positive effect on objective outcome measures associated with

health parameters.

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