

**Evaluation of a Pilot Nutrition Education Program Delivered by Hmong Community
Health Workers (CHWs)**

By

**Jeanette Treiber
Center for Evaluation and Research
University of California, Davis
Davis, California, USA**

**Nestor Martinez
California Project LEAN
California Department of Public Health
Sacramento, California, USA**

**Kendra Thao
Hmong Women's Heritage Association
Sacramento, California, USA**

**Jyotti Pannu
M.P.H. Program
University of California, Davis
Davis, California, USA**

**Diana Cassady
Public Health Sciences Department
University of California, Davis
Davis, California, USA**

**Corresponding Author:
Jeanette Treiber, PhD
Dept. of Public Health Sciences
University of California, Davis
Davis, California, USA**

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Abstract

Many members of the Hmong population in the United States suffer from comparatively bad health. Moreover, disease prevention messaging that has traditionally been used through various media and healthcare outlets is not as successful with the Hmong as with the general population, due in part to cultural barriers. This paper explores whether community health workers (CHWs) may be a potentially successful way to deliver lessons in disease prevention, especially messages on healthy eating, drinking, and exercising. In addition, it explores the potential impact of a CHW program on participation in the Supplemental Nutrition Assistance Program (SNAP). Following a literature review, a pilot project that used CHWs in the Hmong Community of Sacramento, California is described. It used KAP (Knowledge, Attitude, Practice) measures in a pre-post test. Statistically significant improvement was achieved in knowledge and attitude, and practice, but not in SNAP participation. The program and CHWs were well received as measured by a satisfaction survey of the 131 participants. Overall the pilot project proved to be successful.

Keywords: Nutrition education, Hmong, Supplemental Nutrition Assistance Program, SNAP, CalFresh, Community Health Workers, Evaluation

Introduction

Many members of the Hmong population in the United States suffer from comparatively bad health. Moreover, disease prevention messaging that has traditionally been used through various media and healthcare outlets is not as successful with the Hmong as with the general population, due in part to cultural barriers. This paper explores whether community health workers (CHWs) may be a potentially successful way to deliver lessons in disease prevention, especially healthy eating, drinking, and exercising. In addition, it explores the potential impact of a CHW program on participation in the Supplemental Nutrition Assistance Program (SNAP). This study evaluates a pilot project in the Hmong Community of Sacramento, California.

Background

According to the 2010 US Census, 260,076 Hmong residents live in the United States. Of these, 91,224 live in California (Hmong National Development). Hmong immigrants living in the United States suffer from poor health compared to their US counterparts (Vue, 2011; Martin, 2006). For example, Culhane-Pera et al. (2007) reported the high number of type 2 diabetes cases among Hmong immigrant adults in the US. In a school-based cross-sectional study conducted with 649 Hmong and 2,260 White students, the prevalence of overweight was higher in Hmong than White male adolescents (Stang et al., 2007). In another cross-sectional study with 426 students in 2012, Voorhees et al. found that there was a much higher rate among Hmong students (17%) than White students (7%) that were classified as pre-hypertensive or hypertensive. Moreover, six times more Hmong students had elevated blood pressure compared to Whites; ethnicity was also an independent predictor of acanthosis nigricans, a dark pigmentation of skin around the neck and other body parts that is associated with diabetes.

Several studies showed that Hmong tend to have poor diets that leave children and adults lacking important nutrients. For instance, Mulasi-Pakhriyal et al. (2011) used a 24-hour dietary recall with 335 Hmong children in Minnesota and found that diets were below the recommended amount of fiber, Vitamins A, D and E, Ca, P, Mg and K, and higher in fats and sugars. Researchers have argued that poor health in the Hmong population may be due to environmental change and dietary habits and recommend culturally specific health and nutrition education to counteract the negative trend (Fanzen and Smith, 2008; 2009; Harrison and Kagawa-Singer, 2007; Thalacker, 2010; Shaw, 2008; Mulasi-Pokhriyal and Smith, 2010). One of the ways to achieve culturally responsive health and nutrition education is by using CHWs.

There is compelling evidence that CHWs can improve nutrition knowledge and behaviors within many populations (Plescia, 2008), although they have been most widely used in Latino communities. In their review of 22 studies focused on CHWs providing nutrition education in Latino communities, Dr. Perez-Escamilla and his collaborators (2008) concluded that these programs had a positive impact on participants by increasing their nutrition knowledge and improving their related behaviors, as well as improving dietary behaviors and breastfeeding practices.

The need for health and nutrition education among Hmong immigrant communities is critical because “the prevalence of obesity in the Hmong population is on the rise, especially among children” (Vue 2011, p. 199; Martin, 2006). CHWs have rarely been used in Hmong communities to deliver health messages, and a review of the literature revealed no published studies on the subject. However, the USDA-funded Expanded Food and Nutrition Education Program (EFNEP) in California, Minnesota, and Wisconsin presented the work of the *Building Healthy Families* program at national conferences. When the *Building Healthy Families* curriculum was delivered in Wisconsin and Minnesota to approximately 200 caregivers, the high completion rates confirmed that the curriculum was relevant and valuable to the Hmong participants (in this study California results were not available). More than 70% of participants completed the eight-lesson program. A pre- and post-assessment found positive change in dietary knowledge and behaviors. For instance, in Wisconsin there was a positive change in diet quality (37%-42%) and shopping behaviors (40%-46%). In Minnesota, 68% of participants showed an improvement in dietary quality and 32% an improvement in food safety practices (Martin, 2006, Curtis, 2011).

California Project LEAN

Our study, California Project LEAN (Leaders Encouraging Activity and Nutrition), examines the success of using CHWs in a Hmong community to increase the participation in SNAP and to improve healthy eating and physical activity. Project LEAN was a joint program of the Public Health Institute and the California Department of Public Health. Its goal was to promote nutrition and physical activity in schools and communities in order to prevent obesity and its associated chronic diseases. With funding from the United States Department of Agriculture (USDA), Project LEAN developed a curriculum to both promote SNAP benefits to underserved and low-income families and provide lessons in healthy eating, drinking, and exercising. In addition, the program was aimed at building the capacity of CHWs to teach the curriculum to community members in group settings. The Hmong Women's Heritage Association in Sacramento was a partner in pilot testing the curriculum in the first six months of 2013 by choosing and training peer leaders, and then recruiting community members to participate in SNAP promotion classes.

Prior to starting the project, the Hmong Women's Heritage Association was given the opportunity to revise the curriculum to make it more culturally appropriate for their group. It was then translated into Hmong by a university translation center. In March 2013, Project LEAN staff trainers conducted a one-day training session for CHWs at the Hmong Women's Heritage Association, where they demonstrated how the sessions should be conducted. Twelve CHW classes were conducted in April through June of 2013, and the sessions were hosted in English and Hmong, depending on the dominant language spoken among participants. Translators were present during the training to assist and translate, if needed.

The CHW-delivered curriculum consisted of three two-hour sessions offered in one week intervals. The first session explained the SNAP program, including eligibility, and the best ways to use SNAP benefits to promote a healthy lifestyle. It also introduced a physical activity segment, which was continued in the subsequent two sessions. The second session focused on healthy eating, especially increasing fruit and vegetable consumption. It also included small group activities regarding healthy food shopping and budgeting. The third session had information and exercises pertaining to sugar sweetened beverages based on the *Rethink Your Drink Campaign*. The lessons were very interactive and gave participants assignments to put into practice what they had learned about healthy shopping and cooking during sessions. Participants were also encouraged to apply for SNAP benefits. A SNAP representative was invited to the classes to explain the application process and answer questions; however, a representative only visited some of the classes.

The purpose of this study was to determine whether the CHW approach to promoting healthy eating and exercising, as well as the promotion of SNAP participation, would be successful in the Hmong community as measured by a statistically significant difference in Knowledge, Attitude, and Practice (KAP) scores from pre-to post intervention (USAID). Institutional Review Board approval for the evaluation design was granted by the University of California, Davis.

Methods

A convenience sample of 131 Hmong adults in Sacramento County, CA, was recruited to participate in the nutrition education program. The sampling was done purposively and by snowball method: The Hmong Women's Heritage Association utilized ethnic media (Hmong radio KJAY 1410), recruited internally through existing programs, and conducted community

outreach for participants. The Hmong Women's Heritage Association also recruited CHWs from the community who then recruited their friends, families, and other community members to participate.

The study used a pre-post design. Outcome was measured through a self-administered survey on knowledge, attitudes, and practice (KAP) at the beginning of the first session and the end of the last session, and an item indicating whether SNAP participants had applied for SNAP.

There were four options for participants to select:

- a) "I have not applied for SNAP (food stamps),"
- b) "I have applied, but did not qualify for SNAP (food stamps),"
- c) I have completed a SNAP application and I am waiting to find out if I qualify,"
- d) "I am currently receiving SNAP (food stamps)."

The pre-post survey was an adaptation of a survey used in the 2011 SNAP Promotion pilot test with Latino participants. Adaptations were made to simplify the survey language in order to increase validity. The survey asked ten "true or false" knowledge questions that were based on the curriculum. Four attitude questions asked participants whether they agreed or disagreed with statements about food, exercising, and SNAP benefits. Finally, there were four behavior statements that asked participants to respond on a four-point Likert scale about their intentions regarding food, exercising, and SNAP. In addition, the survey asked demographic questions about age range, gender, US-born or not, level of education, race/ethnicity, and language spoken at home.

The Process evaluation was conducted to determine participant satisfaction with the program. For this purpose, a satisfaction survey was administered after the final class session. The survey asked participants to rate the overall quality and usefulness of the class sessions, and

the usefulness of having a SNAP outreach worker present. The survey had primarily closed-ended questions and one open-ended question.

Analysis

Descriptive statistics was used for the analysis of demographic questions. The pre- and post-KAP survey data were entered into an Excel spreadsheet and then imported into the Statistical Package for the Social Sciences (SPSS). Knowledge statement responses were coded as 1 for correct and 2 for incorrect; (Table 1, statements 1 through 10). The attitude statements were coded as 1 for desirable attitude and 2 for undesirable attitude (Table 1, items 11 - 14). The practice statements on the Likert scale were coded from 1 to 4 with 1 = not likely, and 4 = very likely. An exact McNemar test was performed to determine whether there was a statistically significant difference in the proportion of correct (or desired) answers pre and post, using SPSS. This test was also used for the question about whether or not the participant was receiving SNAP or had applied for it. We used the McNemar test because it is a non-parametric test for two related dichotomous variables (Resnick, 2002; Laerd Statistics). An asymptotic McNemar test was performed where exact tests were not possible due to sample size. For the practice portion of the test, which was based on a 4 point Likert Scale, we performed a paired t-test to assess statistically significant difference between participants' statements pre-intervention to post intervention (Table 2). For the satisfaction survey, descriptive statistics were used for the closed-ended question and content analysis for the open-ended question.

Results

Sociodemographic Profile of Participants

The Hmong class sessions attracted 131 participants in total, but not all attended all sessions. There were 116 matches between pre and post participants. These 116 responses are therefore included in the analysis. At baseline, of the 116 participants one was less than 18 years old, the majority (60%) were 18 to 30 years old, nearly the same number of participants were 31 to 59 years old (44%), and 4% were over 60 years old. The majority (55%) were female, and 44% male; about half (48%) were born in the United States, and 52% were not. Education levels varied widely with 9% never having gone to school, 3% having an elementary education, 6% less than high school, 26% a high school diploma, 30% some college/vocational school, and 19.8% were college graduates. All participants identified as Asian, and 57% spoke Hmong at home. At baseline, 16 % participants were enrolled in SNAP, and 16% were enrolled at the end. At baseline, 3 had applied, and in the end 7 had applied.

Outcome evaluation results: Changes in Knowledge, Attitude, Practice (KAP)

Table 1 (at the end of the paper) shows that participants increased their knowledge for all items between pre-and post- tests. Moreover, the pre-post McNemar Significance tests showed statistically significant differences in most responses ($p < .05$). Of the knowledge statements (statements 1-10 in Table 1 which may be viewed at the end of the paper), six showed a statistically significant improvement after the course. However, none of the items in the statements relating to attitudes (physical activity, eating fruits and vegetables, drinking sugary drinks, and using SNAP to purchase healthy food) showed a statistically significant change, meaning that participants' attitudes or beliefs regarding these items did not change significantly.

The pre-post paired t-test of the practice ranking items showed that three of the four practice statements (drinking fewer sugary drinks, eating more fruits and vegetables, and being more physically active), showed statistically significant differences. Applying for SNAP (food stamps) did not (Table 2 which may be viewed at the end of the paper).

Process evaluation results: Satisfaction with the CHW approach

In the satisfaction survey several participants mentioned that a SNAP outreach worker did not come to the class but would have been useful to have (one participant also stated that a Hmong-speaking outreach worker would have been helpful). Answers to open-ended questions also showed that the classes where SNAP outreach workers were present helped answer many questions that the peer leaders were unable to answer. They also offered support in filling out applications. This suggests that SNAP eligibility information is a highly valued contributor to satisfaction with the class. While CHWs were well received as teachers of health, nutrition, and physical activity messages, the limitation of their expertise in SNAP eligibility and application process became apparent. However, overall, class satisfaction was very high with 66% rating class quality as “excellent,” 27% as “good,” and 3% as fair; 62% thought the class was “very useful,” 31% thought it was “useful,” and 3% thought it was somewhat useful.

Discussion and Recommendations

Similar to the *Building Healthy Families* campaign among Hmong communities in Minnesota, Wisconsin, and California (Martin, 2006, Curtis, 2011), the SNAP promotion pilot project using CHWs in a Hmong community in Sacramento, California, showed great success in that self-reported health behavior and knowledge among Hmong participants improved significantly. CHWs were successful in teaching the curriculum, as shown by significant increases in the correct responses on knowledge questions and higher scores on desired behavior,

as well as an increase in SNAP recipients and SNAP applications and high satisfaction among participants. While the pilot project helped to dispel myths about SNAP, the evaluation found that peer leaders and participants still had some questions and misunderstandings about eligibility. Having a SNAP representative present at the peer leader training may enable peer leaders to answer more participant questions. A surprising finding is the high retention rate of 88.5% (131 participants started the class and 116 were retained). Since retention in multiple session classes is a concern, a high retention rate can be considered a contributor to success. The close-knit Hmong community in Sacramento and the fact that the CHW's knew participants in their group personally may have helped with retention.

New Contribution to the Literature.

This study shows that CHWs can be trained to deliver health and nutrition education to Hmong communities very successfully. This study confirms the findings of the USDA-funded Expanded Food and Nutrition Education Program (EFNEP) in Wisconsin and Minnesota that also used community health workers to teach health and nutrition classes among the Hmong population. Our study shows that a similar program can be successful in California. Moreover, the retention rate was even higher in our study (88.5%) than in the EFNEP study (70%). We also learned from our study that SNAP applications can be increased through incorporation of eligibility and application requirement information into the teaching of the health and nutrition classes. However, in order to achieve better results with this aspect of the program, a stronger presence of an official expert on the eligibility and application process for SNAP may be necessary.

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Table 1

Exact McNemar Significance Test results for pre-post Knowledge and Attitude scores (percent in parenthesis);

*P = statistical significance at $p < .05$; * = asymptotic; CalFresh = California's SNAP program^a*

Variable	Pre-test # (%)	Post –test # (%)	p
Consuming sugary drinks can lead to obesity. Yes (correct)	110 (95)	115 (99)	.06
A typical 20-oz bottle of soda has 17 teaspoons of sugar. Yes (correct)	92 (79)	109 (94)	.000*
CalFresh (Food stamps) can be used at some local farmers markets. Yes (correct)	84 (72)	110 (95)	.000
Eating fruits and vegetables can help adults lower their risk for stroke, heart disease, and high blood pressure. Yes (correct)	113 (97)	116 (100)	.25
Being physically active for at least 30 minutes a day is good for your health. Yes (correct)	111 (96)	116 (100)	.063
You can apply for CalFresh if you have money in a savings account. Yes (correct)	61 (53)	95 (82)	0.000*
Authorities will take your fingerprints if you apply for CalFresh. No (correct)	66 (57)	99 (85)	0.000*
If you receive WIC (Women, Infants and Children Program), you will not be able to apply for CalFresh. No (correct)	83 (72)	95 (82)	.296*
If a person has a job, they cannot apply for CalFresh. No (correct)	33 (28)	98 (85)	.025*
CalFresh can be used to purchase seeds and plants to grow your own fruits and vegetables. Yes (correct)	51 (44)	78 (67)	.000*

Making time to be physically active each week will benefit my health.

Yes (desired attitude) 113 (97) 112 (97) 1.0

Eating fruits and vegetables is important for my health and my family's health.

Yes (desired attitude) 114 (98) 112 (97) .687

If I drink less sugary drinks like sodas, I may lose weight and be healthier.

Yes (desired attitude) 103 (89) 110 (95) .118

Using CalFresh can help families purchase healthy food

Yes (desired attitude) 109 (94) 109 (94) 1.0

^aCalFresh is the term used in California for the SNAP (Supplemental Nutrition Assistance Program). Apart from the name, the program in California is the same as in other states.

Table 2

Eating, drinking, physical activity and SNAP applications: Pre-post paired t-test results of four-point Likert scale

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Drink fewer drinks	.35345	.81565	.07573	.20344	.50346	-4.667	115	.000
Eat more fruits and vegetables	.31034	.80664	.07490	.16199	.45870	-4.144	115	.000
Be more physically active	.33621	.79064	.07341	.19080	.48162	-4.580	115	.000
Apply for SNAP (food stamps)	.11207	1.22844	.11406	-.11386	.33800	-.983	115	.328

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