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Social influence and motivation to change health behaviors among Mexican origin adults: Implications for diet and physical activity

Sato Ashida¹, Anna V. Wilkinson², and Laura M. Koehly¹

¹Social Network Methods Section, Social & Behavioral Research Branch, National Human Genome Research Institute, National Institutes of Health, Bethesda, Maryland ²Department of Epidemiology, University of Texas MD Anderson Cancer Center, Houston, Texas

Abstract

Purpose—To evaluate whether influence from social network members is associated with motivation to change dietary and physical activity behaviors.

Design—Baseline assessment followed by mailing of family health history-based personalized messages (2 weeks) and follow-up assessment (3 months).

Setting—Families from an ongoing population-based cohort in Houston, TX.

Subjects—475 adults from 161 Mexican origin families. Out of 347 households contacted, 162 (47%) participated.

Measures—Family health history, social networks, and motivation to change behaviors.

Analysis—Two-level logistic regression modeling.

Results—Having at least one network member who encourages one to eat more fruits and vegetables ($p=.010$) and to engage in regular physical activity ($p=.046$) was associated with motivation to change the relevant behavior. About 40% of the participants did not have encouragers for these behaviors.

Conclusions—Identification of new encouragers within networks and targeting natural encouragers (e.g., children, spouses) may increase the efficacy of interventions to motivate behavioral changes among Mexican origin adults.

Keywords

social influence; behavioral motivation; family health history; Mexican American

Indexing key words

Manuscript format: research; Research purpose: modeling/relationship testing; Study design: quasi-experimental; Outcome measure: cognitive; Setting: family, local community; Health focus: fitness/physical activity, nutrition; Strategy: education; Target population age: adults; Target population circumstances: Mexican American, Houston, TX

PURPOSE

Obesity is one of the leading public health concerns in the U.S.¹ The CDC's *Healthy People 2010* identifies increasing the consumption of healthful foods and engagement in daily

physical activity as national priority goals.² The prevalence of obesity is higher among Mexican-Americans compared to non-Hispanic whites.¹ In order to eliminate health disparities, culturally relevant intervention strategies for this high-risk group need to be identified.

Social interactions impact individuals' health behaviors.³ Close social relationships (e.g., family, friends) are especially important to Mexican Americans because of the cultural belief that emphasizes the importance of family (*familismo*).⁴ Given the limited success of previous interventions that focus on education and changes in environmental factors,⁵ considering social influence from network members provides a potentially culturally appropriate strategy to motivate individual behavior change in this population.

One's perceptions about the likelihood of performing a health-related behavior has consistently been the most important predictor of behavioral changes.⁶ Contemplation of a behavior is an essential step toward preparing individuals to adopt the behavior.⁷ Thus, investigating the factors associated with motivation to change health behaviors can inform interventions. We hypothesized that the presence of network members who encouraged engagement in healthy diet and physical activity behaviors would be associated with individuals' motivation to improve those behaviors.

METHODS

Design and Sample

Between 2008 and 2009, 162 Mexican origin multigenerational families were recruited from an ongoing population-based cohort in Houston, TX.⁸ Cohort recruitment methods have been described previously.⁸ At baseline, three or more adults from each family ($N=497$) reported their age, gender, level of educational attainment, country of birth, and family health history in either English or Spanish. Within two weeks, by mail, individuals received one or more of the following printed materials generated using the CDC's Family Healthcare™ tool:⁹ (a) a pedigree depicting family health history (FHH), (b) health risk assessments for heart disease, diabetes, and cancer, and (c) personalized behavioral recommendations. Receipt of the materials was confirmed over the telephone about 1 week after the materials were mailed. Follow-up telephone interviews were conducted with 475 participants (96%) from 161 households (99%) approximately 3 months later to assess motivation to change diet and physical activity behaviors, social network characteristics, and the current diet and physical activity behaviors. The main study (approved by Institutional Review Boards at the National Human Genome Research Institute and The University of Texas M.D. Anderson Cancer Center) investigates whether personalized risk feedback influences if family members share FHH with others. Therefore, households were randomly assigned to one of four conditions based on two factors: (1) all participating members vs. one member received personalized risk assessments, and (2) whether tailored behavioral recommendations were included with risk assessments or not.

Measures

Motivation to change behaviors—The dependent variables were assessed by a single question, “What are changes in lifestyle behaviors that you would like to improve?” followed by a list of 6 behaviors. Two dichotomous variables were created based on whether participants endorsed diet and/or exercise (1 = Yes, 0 = No).

Social Influence—Participants enumerated their social network members by listing “friends and family who have played a significant role in [your] life during the past year,” and further selected those “who have encouraged [you] to (eat more fruits and vegetables/get

regular physical activity).” A dichotomized variable was created for each behavior indicating whether participants had at least one encourager (1) or not (0).

Covariates—*Current behaviors* were assessed using the following Family Healthware™ items:⁹ “On average, how many servings of fruits and vegetables do you eat each day?” (none (0) to 10 or more a day (7)); “On average, how many times per week do you participate in physical activity such as: walking, mowing the lawn, running, exercise classes, dancing, swimming, bicycling, soccer etc.?” (never (0) to 5 or more times a week (5)); and “On average, how long do you do these activities each time?” (less than 10 minutes to 40 or more minutes, in 10 minute increments). Responses to the exercise duration were re-coded into median values and multiplied by the frequency values to obtain approximate minutes per week of physical activity.

A sum of the number of health-related conditions participants reported that they had been diagnosed with among heart disease, high blood pressure, high cholesterol, and diabetes yielded *personal health history* (range = 0–4). Based on participant’s FHH, health risk levels were calculated using the Family Healthware:™ low risk (0), moderate risk (1), and strong risk (2).⁹ An indicator was created for those who received an increased family risk (moderate or strong risk) message for heart disease or diabetes. Each participant received a score that reflected the *health behavior recommendations* they received based on their health risk and behaviors at baseline: received recommendations to increase fruit and vegetable intake/physical activity (1), continue current behaviors (0), or did not receive recommendation (0). Self-reported height and weight were used to calculate body mass index (BMI).

Analysis

Using HLM 6.08, a two-level logistic regression model was fitted for each dependent variable: motivation to improve diet and motivation to increase physical activity, using a random intercept model to control for clustering within and variability across households.¹⁰ The Level-1 (individual level) covariates were: age, gender, level of educational attainment, country of birth, personal and family health history and current behaviors, and receipt of family risk message and behavioral recommendations. BMI was included in the dietary behavior model only, due to high collinearity with the physical activity recommendations. The Level-2 (household level) covariate was the randomization condition: all, one, or no (referent group) participating member(s) received behavioral recommendations to control for indirect exposure to behavioral recommendation within households.

RESULTS

Characteristics of the sample are presented in Table 1. About half indicated that they wanted to increase fruit and vegetable consumption (53%) and physical activity levels (51%) at follow-up. Sixty-one percent had at least one network member who encouraged them to eat more fruits and vegetables and 58% had at least one member who encouraged them to engage in regular physical activity.

Out of 7,596 social network members enumerated by the participants, 645 (8.5%) were identified as an encourager for dietary behavior. Of those, 23% were biological children, 17% were spouses, 17% were mothers, 16% were siblings, 12% were aunts/uncles, 5% were fathers, and 6% were friends of the participants. There were 802 (10.6%) network members who encouraged participants to engage in regular physical activity. Of those, 31% were biological children, 17% were siblings, 12% were spouses, 15% were aunts/uncles, 11% were mothers, 6% were fathers, and 4% were friends. A total of 1,092 (14.4%) network

members encouraged at least one of these two behaviors: 737 encouraged one and 355 encouraged both behaviors.

The final models indicated that having at least one social network member who encouraged participants to eat more fruits and vegetables ($OR = 1.65, p = .010$), or to engage in regular physical activity ($OR = 1.51, p = .046$) were both associated with participants' motivation to engage in the relevant behavior (see Table 2). In addition, participants who were sent a message indicating s/he was at increased risk for heart disease or diabetes were more likely to be motivated to increase fruit and vegetable intake ($OR = 1.63, p = .024$). Higher BMI ($OR = 1.09, p < .001$) was associated with motivation to increase fruit and vegetable intake, and male participants were less likely to be motivated to change this behavior ($OR = 0.55, p = .007$) as well as to increase physical activity ($OR = 0.67, p = .030$).

DISCUSSION

Summary

The findings showed that having at least one social network member who encourages participants to increase fruit and vegetable intake or physical activity was associated with motivation to improve the relevant behaviors among adults of Mexican origin in the U.S. Data further indicate that the majority of network members do not provide encouragement to engage in healthful behaviors, with only about 14% of participants' network members encouraging these behaviors and about 40% of the participants reporting not having any encouragers. Public health interventions may focus on identifying new encouragers within individuals' existing networks and eliciting desirable social interactions. The approach used in this study to identify encouragers can be used to further identify members who could become effective encouragers through interventions. Our data suggest that biological children, spouses, and mothers may be especially important. Interventions involving multiple network members may not always be feasible. Because our findings suggest the importance of at least one encourager in motivating behavioral changes, identifying and engaging an influential network member may provide an alternative network approach.

Limitations

Participants were Mexican origin adults from a metropolitan city in the U.S., thus, the findings may not be generalizable to others with different social and cultural backgrounds. Future studies should investigate the role of social influence in adoption and maintenance of behaviors and consider larger social contextual factors (e.g., access to affordable food or exercise facilities, media) that may influence behaviors. The outcome, motivation to change, was measured three months after each family may or may not have received recommendations to change their behavior. The findings may not apply to persons who are not enrolled in an intervention study. The measure of motivation to change also did not consider the strength of the motivation nor the time frame in which respondents desired to change behaviors. The analyses presented here were nested within a larger study. Results should be interpreted with caution considering these limitations.

Significance

Findings suggest the potential utility of social influence in motivating behavioral changes among adults of Mexican origin while calling attention to the lack of encouragement providers for a large number of individuals. The identified sources of encouragement within networks can be the focus of future intervention. Social influence is critical as individuals consider changing health behaviors,³ thus, potential roles of influential motivators identified in this study and types of effective interactions in each stage of behavioral change should be investigated in future research to inform interventions. The finding that FHH risk

information may motivate dietary behavior change, whereas provision of messages to change behaviors was not associated with motivation, suggests the potential utility of family health information in behavioral interventions that have traditionally focused on providing recommendations without regard to this information.

SO WHAT?

What is already known on this topic?

The importance of social influence in facilitating health promoting behaviors has been documented.³ Previous research mostly investigated social influence (e.g., perceptions, behaviors of others) without considering the characteristics of social networks.

What does this article add?

This study found that Mexican origin Americans were more likely to be motivated to change dietary or physical activity behavior if they are encouraged by a social network member. Participants listed few encouragers in their networks highlighting the need to identify new encouragers, potentially by targeting those identified as most likely to provide encouragement in this study (e.g., biological children, spouses). Furthermore, family health history risk information may motivate dietary behavior change among individuals at high risk for developing heart disease or diabetes.

What are the implications for health promotion practice or research?

Interventions may consider targeting family systems rather than individuals to influence social relationships. Future research may investigate the effectiveness of naturally occurring encouragers and encouragers activated by an intervention in the adoption and maintenance of health behavior change.

REFERENCES

1. Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA*. 2006; 295(13):1549–1555. [PubMed: 16595758]
2. Centers for Disease Control and Prevention. *Healthy People 2010*. Washington, DC: U.S. Department of Health and Human Services; 2000.
3. Lewis, MA.; DeVellis, BM.; Sleath, B. Social influence and interpersonal communication in health behavior. In: Glanz, DK.; Rimer, BK.; Lewis, FM., editors. *Health Behavior and Health Education: Theory, Research, and Practice*. 3rd ed. San Francisco, CA: Jossey-Bass; 2002. p. 240-264.
4. Franzini L, Ribble JC, Keddie AM. Understanding the Hispanic paradox. *Ethn Dis*. 2001:496–518. [PubMed: 11572416]
5. U.S. Department of Health and Human Services. *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity*. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General; 2001.
6. Montano, DE.; Kasprzyk, D. The Theory of Reasoned Action and the Theory of Planned Behavior. In: Glanz, DK.; Rimer, BK.; Lewis, FM., editors. *Health Behavior and Health Education: Theory, Research, and Practice*. 3rd ed.. San Francisco: CA: Jossey-Bass; 2002. p. 67-98.
7. Prochaska, JO.; Redding, CA.; Evers, KE. The Transtheoretical Model and stages of change. In: Glanz, K.; Rimer, BK.; Lewis, FM., editors. *Health Behavior and Health Education: Theory, Research, and Practice*. 3rd ed.. San Francisco, CA: Jossey-Bass; 2002. p. 99-120.
8. Wilkinson AV, Spitz MR, Strom SS, et al. Effects of nativity, age at migration, and acculturation on smoking among adult Houston residents of Mexican descent. *Am J Public Health*. 2005; 95(6): 1043–1049. [PubMed: 15914831]

9. Scheuner MT, Wang SJ, Raffel LJ, Larabell SK, Rotter JI. Family history: A comprehensive genetic risk assessment method for the chronic conditions of adulthood. *Am J Med Genet.* 1997; 71(3):315–324. [PubMed: 9268102]
10. Raudenbush, S.; Bryk, A. *Hierarchical Linear Models: Applications and Data Analysis Methods.* Thousand Oaks, CA: Sage Publications, Inc.; 2002.

Table 1Characteristics of the participants ($N = 475$)

	<i>Mean (SD)</i>	<i>Range</i>
Age	41.01 (15.01)	18 – 75
BMI	29.77 (5.88)	13.59 – 56.14
Personal health history [*]	0.87 (1.06)	0 – 4
Family health risk: heart disease and diabetes	0.76 (0.65)	0 – 2
Daily servings of fruits and vegetables [†]	1.51 (0.75)	0 – 6
Minutes per week of physical activity [‡]	100.44 (70.88)	0 – 200
<i>Proportions</i>		
Male, %	44.4	
High school education or less, %	57.8	
Born in Mexico, %	68.8	
Received increased family risk message (HD & DB),% [‡]	51.4	
Received message to increase fruit & vegetable intake,% [‡]	31.2	
Received message to increase physical activity levels,% [‡]	20.2	

^{*} Number of personal diagnoses: heart disease, high blood pressure, high cholesterol, diabetes;

[†] Measured at 3-month follow-up;

[‡] Receipt confirmed 1 week after materials were mailed.

Table 2Predicting motivation to change diet and physical activity behaviors ($N = 475$)

	Motivation to increase fruit and vegetable intake		Motivation to increase physical activity	
	OR	(95% CI)	OR	(95% CI)
Intercept	0.267*	(0.076,0.937)	3.038**	(1.469, 6.281)
All household members received recommendation [‡]	1.483	(0.611,3.600)	0.587	(0.313, 1.101)
One member received recommendation [‡]	1.405	(0.784,2.520)	1.078	(0.608, 1.911)
Age	0.983	(0.965, 1.002)	0.992	(0.975, 1.009)
Male	0.554**	(0.362, 0.848)	0.666*	(0.462, 0.960)
High School education or less	0.850	(0.543, 1.330)	0.789	(0.510, 1.221)
Born in Mexico	0.806	(0.532, 1.221)	0.955	(0.588, 1.552)
BMI	1.088***	(1.045, 1.134)	†	†
Current level of behavior	0.756*	(0.589, 0.971)	0.994***	(0.991, 0.996)
Personal health history	0.944	(0.761, 1.171)	1.054	(0.859, 1.293)
Received increased family risk message	1.629*	(1.066, 2.489)	1.131	(0.748, 1.709)
Received message to improve health behavior	0.780	(0.340, 1.791)	1.254	(0.634, 2.482)
Encourager present	1.647**	(1.131, 2.399)	1.506*	(1.008, 2.248)

* $p < .05$,** $p < .01$,*** $p < .001$

Note:

† Variable not included in this model due to colinearity with another variable, current levels of physical activity;

‡ Entered at Level 2.