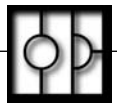

Research Article

Activity Determinants among Mexican American Women in a Border Setting

Bobby Guinn and Vern Vincent

ABSTRACT

Background: *Mexican American women have the highest leisure-time physical inactivity prevalence of any ethnic minority group.* ***Purpose:*** *This study examined a sample of Mexican American females living near the U.S.-Mexico border to determine whether the variables of age, health status, educational level, marital status, and acculturation distinguished between those who are physically active and those who are physically inactive.* ***Methods:*** *Participants included 379 women ranging in age from 22 to 58 years. Data was gathered through a self-report survey instrument with discriminant analysis used to test for variable differentiation between active and inactive subjects.* ***Results:*** *Present activity was comparable to national representative samples, and the discriminant function indicated higher acculturative status and better perceived health differentiated between those women reporting themselves to be physically inactive versus those reporting to be physically active.* ***Discussion:*** *Physical activity interventions targeting border Mexican American women should account for varying acculturation levels.* ***Translation to Health Education Practice:*** *To be effective, program strategies designed to promote physically active lifestyles among border Mexican American women should be linguistically appropriate and culturally sensitive to optimize behavior change.*

BACKGROUND

Insufficient physical activity is an important correlate of a number of health disorders, including increased risk of coronary heart disease, colon cancer, hypertension, and osteoporosis.[1,2] Crespo[3] defined physical inactivity as a lack of participation in any type of leisure-time physical activity, viewing its measurement as less complicated than validly quantifying amounts and patterns of physical activity. As a result of technological advances engineering physical exertion out of daily routines, participation during leisure time has become the most widely studied form of activity assessment. Even though most people have greater amounts of leisure time than in the past, our society is becoming more sedentary; it is estimated that only 32% of the U.S. population age 18 and older regularly engages in moderate physical activity.[4]

An alarming issue attendant to this problem is the very low level of physical activity among minority ethnic groups. This is most evident in the high prevalence of physical inactivity observed among Mexican American women. The literature indicates that Mexican American females, regardless of occupational status, were least likely to engage in moderate or vigorous physical activity or to be physically active during leisure time when compared with Black and non-Hispanic White females.[5,6]

Regular physical activity can help to control body weight, and measuring activity levels is of particular concern in view of our nation's overweight and obesity prevalence. *Healthy People 2010* placed overweight and obesity among the country's ten leading health indicators.[7-11] Indeed, being overweight decreases life expectancy by one to three years and increases the risk from all-cause mortality from 50 to 100%.[7] Despite these health risks, U.S. overweight and obesity estimates have dramatically increased in recent years, particularly among Mexican Americans. While the prevalence of overweight (i.e., body mass index [BMI] of at least 25.0) in the overall adult population is approximately 66.3%, among Mexican Americans it is 75.8%.[12] Additionally, obesity

Bobby Guinn is a professor in the Department of Health and Kinesiology, University of Texas–Pan American, 1201 W. University Dr., Edinburg, TX 78541; E-mail: rguinn@utpa.edu. Vern Vincent is a professor emeritus in the Department of Computer Information Systems and Quantitative Methods, University of Texas–Pan American; E-mail: vernvincent@sbcglobal.net.

(i.e., BMI of 30.0 to 39.9) is prevalent in 40.0% of Mexican American women,[13] and morbid obesity (i.e., BMI of 40.0 or greater) increased four- to fivefold among this group between 1990 and 2000.[14]

The enormity of the physical inactivity and overweight/obesity issue among Mexican American women is underscored by their level of chronic disease risk and morbidity. When compared with non-Hispanic Whites, Mexican American females have two to three times greater Type 2 diabetes rates, are 6 times more likely to develop end-stage renal disease, and are more subject to severe hyperglycemia and its related complications of hypertension, hyperlipidemia, and atherosclerotic vascular disease.[15-19]

Energy imbalance resulting from a combination of increased energy intake and decreased energy expenditure contributes to overweight and obesity. Interventions designed to reduce energy imbalance must include strategies that create increased expenditure and/or decrease intake. Moderate and regular physical activity is a critical component of any weight-control program; however, studies on the topic report decreased activity to be an independent predictor of obesity in female Mexican Americans.[20,21] Because of the extremely high prevalence of physical inactivity among this population, identification of factors associated with regular activity involvement must occur before effective interventions can be developed.

Studies of leisure-time physical activity determinants in the general adult population have reported age, health, education, and marital status as factors influencing participation. Acculturation, because of its influence on the overall well-being of an individual, has been widely investigated among foreign-born Mexican Americans regarding relationships with selected health and behavioral outcomes. Adult leisure-time physical activity is negatively related to age; as people grow older, the prevalence of activity participation decreases.[2,6,22] Health status is positively related to physical activity; persons with better health have greater activity repertoire size and degree of involvement as well as stronger likelihood of continuing activity than those with poorer health.[23,24] Education, as a criterion of socioeconomic status, exerts a powerful influence on health-related behavior.[25] Persons of high educational attainment are more physically active than those of lower educational level, encountering fewer economic, physical, and social constraints to leisure activity, and responding more readily to appeals from health professionals to modify their lifestyles related to physical activity.[11,26,27] The effect of marital status on leisure activity participation is generally a result of the orderly life that marriage presents for a number of health-related behaviors. In addition to being more physically active, married persons generally enjoy better health and greater life expectancy than singles.[25] Widowhood and divorce, which can result in degrees of social isolation as well as changes in economic status, are associated with decreased activity participation.[28]

Acculturation is the social process of becoming adapted to a new or different culture and is considered to be a prominent step toward assimilation.[29] This process allows persons to effectively function in a society by distancing their culture of origin and accepting the host country's mainstream beliefs and customs.[30] Landrine and Klonoff[31] view acculturation as a continuum from traditional to acculturated; traditional persons remain immersed in many of the beliefs, practices, and values of their own culture whereas highly acculturated persons have rejected the beliefs and practices of their own culture in favor of those of the mainstream culture. The literature dealing with the effects of acculturation on health-related behaviors and outcomes among persons of Mexican origin indicates use of illicit drugs and alcohol and tobacco, patterns of unhealthy dietary practices, and obesity prevalence are stronger among those who are more acculturated than among those less acculturated.[20,32-35] However, no clear association has been demonstrated between acculturation and physical activity prevalence among this population. Results of studies examining this relationship report negative associations,[36-38] positive associations,[39,40] and no effect.[41] Lara and others[34] attribute this lack of a clear relationship to either an insufficient number and/or quality of studies or multiple studies that demonstrated opposite effects.

PURPOSE

In view of the disturbing overweight and obesity trend among Mexican American females and its potential impact on a number of co-morbidities, it is important that factors influencing physical activity among this subgroup be investigated. These trends assume particular urgency given that Hispanics are the largest and fastest growing ethnic minority in the United States and are projected to comprise 21% of the population by 2020.[42] Therefore, the purpose of this study was to extend the research on factors influencing leisure-time physical activity participation among Mexican American females. Specifically, the influence of age, health, education, marital status, and acculturation was assessed through identification of which variables distinguish between physically active and physically inactive females.

METHODS

Sample and Administration

The study sample was drawn from the rural Lower Rio Grande Valley (LRGV) region of South Texas. The LRGV lies in the easternmost part of the U.S.-Mexico border, with a population overwhelmingly of Mexican origin. Subjects were the parents and adult relatives of students enrolled in three border-serving elementary schools from a LRGV school district in which Mexican Americans comprise 97.2% of the total student body. A self-report questionnaire instrument was distributed to all students in three randomly selected fourth- and fifth-grade classes in each of the three schools. Students were given two copies of the questionnaire copies and asked to present them to parents and/or adult family members in the household, returning them within three days. Students were informed that taking the questionnaires home was voluntary and that their relatives' participation was both voluntary and anonymous. The study's

purpose and voluntary nature were also indicated on the instrument. All Human Subjects Research Board stipulations were observed to protect the confidentiality and rights of the respondents. As an incentive to present the questionnaire to adult household members, students were given a voucher for a fat-free frozen dessert for each returned respondent-completed questionnaire. This incentive-by-extension procedure (i.e. the adult's incentive to participate is seeing the child rewarded) is a recognized method of increasing response rate and data adequacy.[43] A total of 648 instruments were distributed and 494 were returned. Deletion of erroneously marked instruments yielded 469 usable tests; of these, 379 respondents identified themselves as Mexican American females, and they comprised the study sample.

Instrumentation

Each item on the survey instrument used to collect the data was dually printed in both English and Spanish to accommodate non-English-speaking participants, with items translated into Spanish and back-translated to ensure accuracy, clarification, and content preservation. For the purposes of the study, physical activity was defined on the instrument as engagement in moderate to vigorous activities during leisure and/or free time. Age, gender, ethnicity, and marital status were appraised through single-item indices, while activity level, health status, education, and acculturation were measured as described below.

Present activity level. Current physical activity level was assessed by the subject's response to the statement, "The number of times a week I participate in at least 10 minutes of moderate to vigorous leisure-time physical activity which causes an increase in breathing or heart rate is...." Possible responses ranged from "none" to "5 or more times." This outcome measure was based on the National Center for Health Statistics[14] method of appraisal and reporting leisure-time physical activity among adults. To help clarify this item, activity examples based on the Compendium of Physical Activity metabolic equivalent (MET) values were listed on the instrument.[44] Examples given as moderate activities included bowling, dancing, golf, yoga, walking at a moderate or vigorous pace, softball, and lifting weights. Vigorous activity examples included aerobics, jogging/running, basketball, tennis, soccer, riding a stationary bicycle or bicycling outside, swimming, and roller skating/rollerblading.

Health status. Perceived health status was measured by the question, "In general, what is your overall heath?" Possible responses (excellent, very good, good, fair, poor) were scored on a scale of 5 to 1. For the purposes of psychosocial research, this subjective evaluation has been demonstrated to be a valid indicator of wellness regardless of ethnicity.[45,46]

Educational level. Educational attainment was based on responses to the question, "How much education have you had?" Possible responses, scored on a scale of 1 to 5, were "8th grade or less," "some high school," "high school or trade school graduate," "some college," or "college graduate or higher."

Acculturation. English-language use, which measures functional integration into the U.S. mainstream, is recognized as one of the most powerful indicators of acculturation.[47] Accordingly, participants' acculturative status was determined through Marin et al.'s[48] language-use acculturation scale. Developed specifically for Hispanics, this scale has correlated highly with the acculturation criteria of a respondent's generation (r=0.69), length of residence in the United States (r=0.76), and age of arrival (r=-0.72).[49] The scale consists of four statements: (1) In general, what language do you read and speak? (2) What language do you usually speak at home? (3) In which language do you think? (4) What language do you usually speak with your friends? Each statement is rated on a five-point response option ranging from "Spanish only," "Spanish better than English," "both equally," "English better than Spanish," "English only." The instrument's theoretical range is 4 to 20, with a higher score indicating greater acculturation. The scale's internal consistency alpha for the present study was .96.

Statistical Analysis

Two-group discriminant analysis with stepwise procedure employing the Mahalanobis D^2 method was used to determine which of the investigated variables made the greatest contribution in discerning between physically inactive and physically active Mexican American women.[50] Pearson correlation coefficients were computed to ascertain degree of association between variables as well as descriptive statistics determined for all variables. All data analyses were conducted using SPSS Version 13.0.

RESULTS

The study sample (N=379) ranged in age from 22 to 58 years, with a mean of 33.2 years. Participants' present physical activity level was low, with 21.4% indicating no weekly participation and 37.2% reporting only one to two 10-minute leisure-time sessions per week. These inactivity levels are comparable with those reported by national representative samplings of Mexican American women.[39]

Self-reported health status indicated the participants perceived themselves to be relatively healthy, with 68.1% reporting overall health as very good to excellent. The majority, 74.5%, reported themselves as currently married. Educational attainment was relatively low; 39.3% did not graduate from either high school or trade school, 25.0% were high school or trade school graduates, and 35.7% reported some college-level work or higher. Acculturative status was moderate, with the sample's mean acculturation score being 10.3 on a scale of 4 to 20. Table 1 presents a descriptive profile of the participants.

Correlation coefficients between activity level and investigated variables revealed statistically significant positive relationships with acculturation (r=.252, $p<.001$) and health status (r=.179, $p<.01$). The reason for these relatively modest correlations is the large sample size, which tends to overpower the test.[50] Nevertheless, they indicate physical activity levels were higher among those more acculturated and reporting better health. This finding is consistent with

research suggesting that more acculturated female Hispanics perceive themselves as being healthier than less acculturated female Hispanics.[51]

To achieve the study's purpose of identifying which factors influence physical activity participation, the polar-extremes approach was used to group subjects into inactive and active categories.[50] Those respondents indicating none or one activity session per week were placed in the physically inactive group, and those indicating four or more sessions per week were placed in the physically active group. This method yielded 141 physically inactive and 81 physically active respondents.

A discriminant function model was generated to determine what variable differences existed between the inactive and active groups. The discriminant analysis produced a statistically significant Wilks' lambda, .91 (alpha=.001), indicating a difference between the groups. Additionally, the discriminant function was evaluated for predictive accuracy by means of a classification "hit" matrix. Cross-validation "leave-one-out" classification analysis produced a 53% hit ratio, which did not meet the 67% hit ratio necessary to be at least one-fourth greater than that achieved by chance.[50] Therefore, whereas the function discriminates between inactive and active groups in statistical significance, it only marginally discriminated between groups in practical significance. The discriminant analysis retained acculturation and health status as the only statistically significant ($p<.05$) predictors of membership in the physically inactive or active groups. In other words, among the border Mexican American women studied, only acculturative status and perceived health differentiated between those who were inactive and those who were active. Table 2 presents the structure matrix for the activity participation influences serving as independent variables.

Table 1. Description of the Sample

Variable	No.	%
Weekly activity sessions		
None	81	(21.4)
One	60	(15.8)
Two	81	(21.4)
Three	76	(20.1)
Four	40	(10.6)
Five or more	41	(10.7)
Self-rated health		
Excellent	93	(24.5)
Very good	169	(44.6)
Good	102	(26.9)
Fair	10	(2.6)
Poor	5	(1.4)
Marital status		
Married now	282	(74.5)
Never married	48	(12.7)
Divorced/separated	43	(11.3)
Widowed	6	(1.5)
Educational level		
8th-grade or less	105	(27.7)
Some high school	44	(11.6)
High school or trade school graduate	95	(25.0)
Some college	84	(22.3)
College graduate or higher	51	(13.4)

DISCUSSION

As mentioned above, results indicated that acculturative level and, to a lesser degree, health status were the key factors differentiating between border-area Mexican American women who were active and those who were not. In contrast, age, education, and marital status showed no discriminating value between the two groups.

The lack of influence shown by age and education on physical activity participation may be explained by the Third National Health and Nutrition Examination Survey (NHANES III) findings, which reported that Mexican Americans are (1) inactive beginning early in adult life rather than decreasing their activity levels with age, and (2) more inactive than non-Hispanic Whites regardless of educational attainment.[6] As for marital status, its lack of effect on activity participation was due to the statistically greater proportion of the sample reporting themselves as currently married versus those who reported being unmarried, divorced/separated, or widowed.

The literature is clear on the relationship between health and activity involvement. As a direct result of impairment in function and physical disability produced by health conditions, physical activity levels decline commensurately with poorer health.[2] Although previously mentioned studies have reported positive, negative, or no effects of acculturation on leisure-time activity participation, this study indicates that it has a strong positive influence on such behavior. Attempts to explain what Williams[52] referred to as an epidemiological paradox—i.e., poor socioeconomic status and favorable health indicators among border Hispanic populations—have centered around the impact of acculturative status on health behavior. At the same time, the less acculturated an individual is, the less likely he or she is to engage in health-risking behaviors common to the mainstream culture.

Table 2. Discriminate Function Structure Matrix

Variable	Function Loadings
Acculturation*	.857
Health status*	.600
Educational level	.526
Age	.161
Marital status	.024

*p<.05

The finding that greater acculturation is positively associated with leisure-time physical activity may, in part, be the result of accompanying English-language proficiency. Conversely, the lack of English-language skills could serve as an obstacle to physical activity involvement as border Mexican American women are exposed to English-language messages regarding the health-promoting benefits of physical activity at work, in civic and social environments, and via mass media. English-language acquisition, integral to assimilation, may therefore allow such activity-promoting information to begin affecting these women's beliefs and attitudes.

TRANSLATION TO HEALTH EDUCATION PRACTICE

Based on these findings, interventions promoting physical activity among border area Mexican American women should be directed toward those who are less acculturated. This would necessitate development of culturally relevant forms of physical activity and promotion of active lifestyles in ethnic-specific formats. Programming features should include Spanish-language presentation and materials emphasizing family engagement, appropriate role modeling, and long-term health benefits.

As to the issue of conflicting reports on the acculturation/activity association, Crespo et al.[39] indicated that these mixed results further illustrate the problems in assessing physical activities outside of leisure time and may not take into account the cultural validity of these types of questions (e.g., determining whether Mexican Americans interpret "leisure time" differently than the rest of society). Additionally, Dixon et al.[53] suggested the absence of a clear relationship may be due to the difficulties in differentiating populations based on only one characteristic of acculturation, such as language use, without adjusting for non-language domains such as values and attitudes.

Several limitations of this study should be acknowledged. The participants were a convenience sample of Mexican American women residing in a rural southern Texas border area, and the results' generalizability may therefore be limited geographically and demographically. Moreover, data was gathered through the use of a self-report instrument, and this methodological limitation may not take into account (1) the respondents' interpretation of all items, or (2) the possibility that some instruments may have been completed by persons other than those from the intended study sample (though it should be emphasized that each instrument was scrutinized to ascertain that it was completed by an adult subject). In addition, data relating to occupation and income was not available. This information could help explain variable implications more fully, as well as aid in identifying perceived socioeconomic barriers to participation.

Other limitations include the fact that only the language-use dimension was used to assess acculturation. Future investigations including the dimensions of country of origin, age of arrival, and length of residence in the United States could help to more adequately explain the complexity of this construct. Additionally, the results were based on leisure-time activities only and did not include work-related physical activity. Although Mexican Americans' leisure-time inactivity has been reported to be higher than that of non-Hispanic Whites, they engage more frequently in physically active jobs than non-Hispanic Whites.[6,54] This may help explain some of the physical inactivity disparities reported. More research is needed to explore the role that incidental, transportational, and occupational activities play in Mexican American women's reporting of physical activity engagement.

Despite its limitations, this study adds to the physical activity literature in an underreported and rapidly growing population group. Many factors affect activity participation, and acculturation and health status are but two considerations—albeit important ones—in the design, planning, and implementation of public health initiatives for the Mexican American community. This study's findings provide a starting point for the development of culturally sensitive programs promoting leisure-time activity participation targeting border Mexican Americans. Although it is promising from a statistical standpoint, the study also reveals the need for further investigation as to the role that other factors may play in activity prevalence among an ethnic minority having the nation's greatest physical inactivity disparity.

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