BRIEF REPORT

Barriers and Benefits to Leisure-Time Physical Activity Among Older Mexican Americans

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Objective: To identify the perceived barriers to and benefits of leisure-time physical activity among older Mexican Americans (MA) and European Americans (EA).

Design: Cross-sectional survey using in-home interviews of subjects.

Setting: Subjects recruited from 10 family practice offices in South Texas that are part of a practice-based research network.

Participants: Two hundred ten MA and EA adults, aged 60 years and older, interviewed between April 1994 and April 1996.

Measurements: The perceived benefits and barriers summary score from the San Diego Health and Exercise Questionnaire, the Minnesota Leisure Time Physical Activity Questionnaire, body mass index, chronic diseases, depressive symptoms, and demographics.

Main Results: Older MA reported greater perceived benefits to physical activity and fewer perceived barriers than older MA while having lower levels of habitual physical activity. Lower levels of education, male sex, higher body mass index, and older age were also associated with lower levels of habitual physical activity.

Conclusions: Although MA reported lower levels of physical activity, they perceived greater benefits and fewer barriers to physical activity. These attitudes about physical activity held by older MA may present an opportunity to encourage greater levels of physical activity throughout this population.

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MANY STUDIES show that physical activity improves health, especially in older adults.[1-4] Consistent physical activity improves fitness, endurance, muscle strength, and cardiovascular health.[3-6] In older adults, moderate and heavy exercisers have a lower risk of first heart attack and lower all-cause mortality than their sedentary counterparts.[7-9] Even mild to moderate levels of physical activity are associated with reductions in cardiovascular disease and all-cause mortality.[8-11] In addition to the cardiovascular benefits, regular physical activity alleviates depression, reduces stress, reduces the number of fall-related injuries, and decreases the risk of hip fracture.[12-14] Conversely, lack of physical activity is an independent risk factor in functional dependence and mortality.[15-17]

Despite these proven benefits, many older adults are remaining sedentary. Studies conducted from 1985 to 1991 show that 24% to 30% of US adults report no physical activity.[1-3] Older adults, in particular, show a decline in moderate and vigorous physical activity as they age.[4] Among adults aged 65 to 74 years, only 34% of men and 17% of women expended more than 2000 kcal per week.[4]

Among ethnic minorities, sedentary lifestyles are more prevalent than among the general population.[18-20] Hovell et al[21] showed that Hispanic adults reported walking a mean of 48 minutes per week and engaging in fewer than 2 episodes of vigorous activity per week. Another study showed that 33% of Mexican American (MA) men and 46% of MA women did not participate in any physical activity.[4]

SUBJECTS AND METHODS

SUBJECTS

Between April 1994, and April 1996, 210 community-dwelling, ambulatory adults aged 60 years and older were consecutively recruited to participate in one-on-one interviews about their perceived barriers to and benefits of physical activity. All subjects were recruited from the offices of family physicians at 10 practice sites throughout South Texas. The physicians at these practices were members of a collaborative research group, the South Texas Ambulatory Research Network. Subjects aged 60 years or older and not acutely ill were identified by office staff and invited to participate in the study. Potential subjects were excluded if they were younger than 60 years, were visiting the physician for an acute illness, or had a Mini-Mental State Examination score of less than 17. A score of 17 was used as the cutoff to adjust the Mini-Mental State Examination for the lower educational attainment we anticipated in the MA cohort. The goal was to enroll approximately equal numbers of MA and EA. Subjects who agreed to participate were contacted by telephone or mail to arrange a home visit from the research staff.

DATA COLLECTION

At the home visit, research staff conducted one-on-one interviews to administer the San Diego Health and Exercise Questionnaire (SDHEQ) to measure attitudes toward physical activity and a modified version of the Minnesota Leisure Time Physical Activity Questionnaire (MLTPAQ) to measure self-reported physical activity.[28-30] In addition to the SDHEQ and the MLTPAQ, demographic information was collected via self-report that included age, sex, ethnic background, education, marital status, and income. Information on depressive symptoms was collected during these one-on-one interviews using the short-form 15-item Geriatric Depression Scale (GDS). Height and weight was measured for each subject.

Interview instruments were translated into Spanish using a forward-backward translation process. A pretest version of the entire survey was administered in a pilot test to validate the interview instruments in our target population. The one-on-one interviews were conducted by bilingual interviewers who were trained to conduct the interview in a standardized manner. Quality checks were performed on a random, periodic basis by one of the investigators.

To identify subjects' attitudes toward physical activity, we used the 2 subscales of the SDHEQ—the Barriers to Physical Activity subscale and the Benefits of Physical Activity subscale. The Barriers to Physical Activity Subscale of the SDHEQ consists of 16 items with responses chosen from a 5-point scale that ranges from "never" to "very often." These items were summed to provide an overall estimate of perceived barriers to physical activity, with possible scores ranging from 0 points to 64 points. The Benefits of Physical Activity Subscale consists of 10 items with 5-point Likert-type responses ranging from "strongly disagree" to "strongly agree." An additive summary score was constructed to provide an overall estimate of the perceived benefits of physical activity, with possible scores ranging from 10 points to 50 points. To measure

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Several studies have investigated factors that may explain the lack of physical activity in the general population. The factors associated with current exercise behavior include past exercise behavior, self-efficacy, perceived barriers, friend and family support for exercise, models of exercise, and normative beliefs about exercise.[22-27] Hovell et al[21] found that for middle-aged MA, physical activity correlated most strongly with self-efficacy and friends' support. However, this study did not examine large numbers of older adults, a population group that may gain substantial benefit from greater physical activity. We conducted a cross-sectional, practice-based study to compare the perceived barriers and benefits of physical activity among older MA and European Americans (EA).

RESULTS

As presented in **Table 1**, our sample included 98 (46.7%) MA and 112 (53.3%) EA subjects. Slightly more than half (58%) of the subjects had completed eighth grade and had yearly incomes greater than $12 000 (58.8%). Mean BMI was 28.13 kg/m^2. Less than one fourth (23%) of subjects were depressed and the average number of self-reported chronic diseases was 3 (mean, 2.92 reports). Most subjects (52.4%) were active, expending more than 500 kcal/wk in leisure-time physical activity. Mexican Americans expended less physical activity than EA, with a mean kilocalorie per week value of 1182.16 kcal (SD, 2123.61 kcal) for MA vs 2066.43 kcal (SD, 2478.97 kcal) for EA; $P<0.01$. Only 50 (24%) subjects were participating in vigorous physical activity, expending more than 2000 kcal/wk.

PERCEIVED BENEFITS AND BARRIERS

As **Table 2** presents, compared with EA, MA had perceived greater benefits of exercise (mean MA summary score=37.3 points vs mean EA summary score=35.0 points; $P<.01$) and fewer perceived barriers to exercise (mean MA summary score=21.4 points vs mean EA summary score=24.2; $P=.01$). Subjects who had 8 or

physical activity, we used the modified version of the MLTPAQ, which provided the number of minutes of activity per week for each subject in the year prior to the study. From this questionnaire, the energy expenditure in kilocalories per week was calculated as weekly physical activity. After examining the univariate distribution, physical activity was dichotomized into a "sedentary group" (those who reported ≤500 kcal/wk) versus an "active group" (those who reported >500 kcal/wk). Subjects' ethnicities were classified by the Hazuda algorithm for determination of MA and EA ethnic background.[31] After examining the univariate distributions, education was dichotomized into less than or equal to eighth-grade education vs a greater than eighth-grade education. Similarly, annual household income was dichotomized as less than $12 000 vs $12 000 and higher. Subjects who reported having a score of 5 or higher on the GDS were categorized as having depressive symptoms. To estimate each subject's disease burden, we summed the number of major self-reported diseases to develop a measure of chronic disease. Major diseases included in this measure are diabetes, stroke, hypertension, angina, myocardial infarction, and arthritis. We analyzed this summary measure of chronic diseases as a continuous variable. Age and body mass index (BMI, calculated as weight in kilograms divided by the square of height in meters) were also analyzed as continuous variables.

DATA ANALYSIS

We examined the internal consistency of the items using the Cronbach coefficient α to test the appropriateness of developing a summary score for the Barriers to Physical Activity subscale and the Benefits of Physical Activity subscale. For both subscales, the Cronbach α was at or greater than .75, suggesting that the items could be combined to give one summary score for each subscale.[32] The 2 summary scores were then log transformed to normalize their distribution. The Barriers to Physical Activity summary score and the Benefits of Physical Activity summary score formed our 2 dependent variables of interest. For all analyses, physical activity level measured by the MLTPAQ was also log transformed to normalize its distribution.

After developing summary scores for the 2 subscales, we performed an analysis of variance to determine the association of our main independent variable, ethnic background (MA vs EA), with the 2 subscale scores. We used the same procedure to examine the association between our other independent variables (ie, sex, education, income, and depressive symptoms) and each physical activity subscale summary score. To examine the association of the 2 physical activity subscales with age and current level of habitual physical activity, we performed a *t* test analysis. Next, we performed 3 backward, stepwise, linear regression analyses—one to test the associations with the Barriers to Physical Activity summary score, one to test the associations with the Benefits of Physical Activity summary score, and one to test the associations with habitual physical activity. Independent variables that were significantly associated with either habitual physical activity or the 2 summary scores in the bivariate χ^2 analyses ($P < .01$ to adjust for multiple comparisons) were included in the initial regression models. We also tested a priori for interactions of income with education as well as BMI and comorbid disease. The final parsimonious models are presented for each summary score and habitual physical activity.

fewer years of education also had greater perceived benefits, and perceived fewer barriers to physical activity (benefits mean sum score, 37.72 vs 35.23; $P<.01$; barriers mean sum score, 22.16 vs 23.36; $P=.05$). Women and subjects with a greater number of self-reported chronic diseases had higher perceived barriers to exercise ($P<.01$, respectively) although no difference was noted for perceived benefits to physical activity. Perceived benefits and barriers to physical activity did not differ significantly by income level or depressive symptoms.

ASSOCIATIONS WITH PERCEIVED BENEFITS AND BARRIERS

Mexican Americans compared with EA had a higher mean benefits sum score ($P<.01$) and a lower mean barriers sum score ($P=.05$). Greater activity level, lower BMI, and fewer self-reported chronic diseases were associated with higher perceived benefits of physical activity. Other variables that were associated with lower perceived barriers to physical activity were older age, male sex, and fewer self-reported chronic diseases (Table 2). After controlling for education, self-reported chronic disease, physical activity, sex, and age, those of MA ethnic background remained associated with higher perceived benefits ($P=.05$) and lower perceived barriers ($P<.01$) to physical activity (**Table 3** and **Table 4**).

ASSOCIATIONS WITH HABITUAL PHYSICAL ACTIVITY

Greater habitual physical activity was associated with EA ethnicity, in addition to a higher than eighth-grade education, an annual income of $12 000 or more, not being married, younger age, lower BMI, and fewer chronic diseases (**Table 5**). After controlling for age, ethnicity, level of education, self-reported chronic diseases, sex, marital status, BMI, and depressive symptoms, habitual physical activity remained associated with greater perceived benefits to physical activity

($P<.01$) (**Table 6**). Higher educational levels and being female were also associated with greater habitual physical activity after controlling for other variables. Mexican American ethnicity, higher BMI, and older age were associated with lower habitual physical activity.

Table 1. Demographic Characteristics of the Sample (N = 210)*

Variable	Value
Ethnic background	
Mexican American	98 (46.7)
European American	112 (53.3)
Habitual physical activity	
Sedentary (<500 kcal/day)	100 (47.6)
Active (>500 kcal/day)	110 (52.4)
Education	
≤8th grade	88 (41.9)
>8th grade	122 (58.1)
Annual household income	
≤$11 999	82 (41.2)
≥$12 000	117 (58.8)
Depression	
Yes	48 (23.0)
No	161 (77.0)
Sex	
Men	81 (38.6)
Women	129 (61.4)
Marital status	
Married	68 (32.4)
Not married	142 (67.6)
Mean (SD) [range]	
Benefits summary score (points)	36.06 (4.78) [17-45]
Barriers summary score (points)	22.86 (6.86) [0-64]
Age, y	72.12 (6.32) [60-89]
Body mass index, kg/m^2	28.13 (5.93) [16-57]
No. of chronic diseases	2.92 (2.06) [0-9]

*Values are reported as number (percentage) unless otherwise indicated.

COMMENT

While physical activity has been repeatedly shown to provide health benefits throughout the life cycle, many older adults remain sedentary. Older minorities may be especially prone to lead a sedentary life. Studies on MA show that they are less active than their EA counterparts.[20,21] In our study, we found that MA had lower levels of physical activity than EA, even after controlling for possible confounders. Older MA also perceived fewer barriers and greater benefits of physical activity than EA.

The difference in perceived barriers and perceived benefits between MA and EA may represent a more re-

Table 3. Multivariate Model Predicting Perceived Benefits to Physical Activity*

Variable	Parameter Estimate	SE	*P*
Mexican Americans	0.019	0.010	.05
Chronic diseases	0.002	0.002	.34
Body mass index	−0.097	0.043	.02

*The adjusted $R^2 = 0.08$.

Table 4. Multivariate Model Predicting Perceived Barriers to Physical Activity*

Variable	Parameter Estimate	SE	*P*
Mexican Americans	−0.153	0.039	<.01
Chronic diseases	0.024	0.010	.01
Sex	−0.109	0.040	.01
Age	−0.006	0.003	.07

*The adjusted $R^2 = 0.17$.

Table 2. Association of Independent Variables With Benefits and Barriers to Physical Activity

Variable	Mean ± SD Benefits Summary Score	*P*	Mean ± SD Barriers Summary Score	*P*
Ethnic background				
Mexican American	37.32 ± 4.00	<.01	21.35 ± 5.18	.01
European American	34.96 ± 5.15		24.18 ± 7.84	
Education				
≤8th grade	37.22 ± 4.13	<.01	22.16 ± 5.32	.05
>8th grade	35.23 ± 5.06		23.34 ± 7.77	
Annual household Income				
≤$11 999	36.34 ± 4.14	.97	22.43 ± 5.81	.82
≥$12 000	36.37 ± 4.89		23.15 ± 7.50	
Depression				
Yes	36.08 ± 7.87	.78	24.60 ± 7.88	.09
No	36.11 ± 4.80		22.39 ± 6.46	
Sex				
Men	35.44 ± 5.27	.18	21.05 ± 6.04	<.01
Women	23.99 ± 7.12		36.45 ± 4.43	

Table 5. Association of Independent Variables With Habitual Physical Activity*

Variable	Sedentary	Active	*P*
Ethnic background			
Mexican American	63 (63.0)	35 (31.8)	.001
European American	37 (37.0)	75 (68.2)	
Education			
≤8th grade	62 (62.0)	26 (23.6)	.001
>8th grade	38 (38.0)	84 (76.4)	
Annual household income			
≤$11 999	58 (61.1)	24 (23.1)	.001
≥$12 000	37 (39.0)	80 (76.9)	
Depression			
Yes	24 (24.2)	24 (21.8)	.68
No	75 (75.8)	86 (78.2)	
Sex			
Men	32 (32.0)	49 (44.6)	.062
Women	68 (68.0)	61 (55.4)	
Marital status			
Married	43 (43.0)	25 (22.7)	.002
Not married	57 (57.0)	85 (77.3)	
Mean ± SD age, y	73.44 ± 6.750	71.03 ± 5.692	.006
Mean ± SD body mass index, kg/m^2	29.59 ± 6.779	26.83 ± 4.723	.001
Mean ± SD No. of chronic diseases	3.34 ± 1.981	2.54 ± 2.057	.004
Mean ± SD benefits summary score	35.67 ± 5.057	36.42 ± 4.514	.26
Mean ± SD barriers summary score	23.30 ± 6.39	22.66 ± 7.12	.19

**All values are number (percentage) unless otherwise indicated.*

Table 6. Multivariate Model Predicting Habitual Physical Activity*

Variable	Parameter Estimate	Standard Error	Odds Ratio	95% Confidence Interval
Benefits summary score	0.102	0.039	1.11	1.03-1.20
Mexican American ethnicity	–0.931	0.466	0.39	0.16-0.98
Higher than 8th grade education	1.189	0.468	3.28	1.31-8.22
Body mass index	–0.078	0.031	0.93	0.87-0.98
Women	0.636	0.357	1.89	0.94-3.80
Age	–0.064	0.032	0.94	0.88-1.00

**The adjusted* $R^2 = 0.26$.

alistic appraisal of physical activity by those who are currently active. Active older adults may recognize many of the true barriers to exercise since they must overcome them to remain active. Because they are currently exercising, they know the real personal benefits that physical activity presents them. Future research may be necessary to overcome the effect that real benefits vs perceived benefits have on physical activity in older adults.

Furthermore, these findings present attitudes toward physical activity in MA that might be used to encourage physical activity in this older ethnic minority subpopulation. Overcoming specific barriers may lead to providing facilities and staff in areas that offer easy access for older MA. These findings also suggest that there may be incentives to physical activity in this population. Further research on these perceived barriers and benefits on these perceived barriers and benefits can provide a clinician with a range of techniques to encourage physical activity.

There are some limitations to our study. First, our study was drawn from a population of subjects who were coming in to see their primary care physicians. Because of their vists to the South Texas Ambulatory Research Network practices for medical care, these subjects may have had a greater number of diseases that would affect physical activity than does the general older adult population. However, these subjects may be the most likely to benefit from increased physical activity. Moreover, they represent a cross section of older patients seen in clinical practice. Also, their interaction with a primary care physician may have influenced their thoughts about physical activity. Furthermore, a subject's willingness to participate in the study may reflect specific attitudes toward physical activity.

Second, self-reports of activity level may not correlate precisely with actual physical activity. The MLTPAQ may reflect a different set of cultural preferences regarding physical activity, with older MA preferring a more limited set of activities than those measured by this instrument. However, the MLTPAQ has been used in many other studies of physical activity in younger MA and has been shown to be both reliable and valid.[28] We feel that this limitation would not bias the study results in any particular direction. Third, the use of the summary scores to the individual questions that made up the barriers construct and the benefits construct may mask potential findings on the individual scale items, and impair the survey's ability to discriminate between subjects. However, a composite scale is usually more reliable than individual questionnaire items. Also, the R^2 for the models of barriers and benefits are low, suggesting further work is necessary to understand the predictors of attitudes toward physical activity.

Despite these limitations, our data suggest that older MA perceive greater benefits of physical activity and fewer barriers to physical activity compared with EA. Despite these positive attitudes, older MA are not engaging in higher levels of physical activity that improve health. Even after controlling for income, marital status, number of chronic diseases, higher BMI, lower educational level, being male, and of an older age, MA ethnicity was independently associated with lower habitual physical activity. Using MA's perception of barriers and benefits of exercise may be important in encouraging the initiation of habitual physical activity. But clinicians need to be ready to address the changes in

these perceptions once habitual physical activity has begun. Future intervention programs could be designed to build on these attitudes and enhance physical activity in this group of older MA.

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