Physical activity social support and middle- and older-aged minority women: results from a US survey

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Abstract

Background: Many American adults remain sedentary despite many known health benefits. Research on the determinants of physical activity have indicated that social support is one of the strongest correlates, but little is known about this relation in important subgroups of middle and older-aged women.

Objective: The purpose of this study was to assess the association of physical activity-related social support on several measures of physical activity in a national sample of minority women. A unique aspect of these measures is the inclusion of vigorous household tasks and occupational physical activities.

Methods: The US Women’s Determinants Study was conducted in 1996–1997. The survey was a modified-random sample, telephone survey of 2912 Black, Hispanic, American Indian/Alaskan Native, and White women age 40 and older. A composite score of physical activity social support (PASS) was analyzed as the independent variable in logistic regression analyses. Four measures of physical activity levels served as the dependent variables. A separate analysis was done to distinguish PASS from friends versus PASS from relatives. The potential confounding effect of race/ethnicity, marital status, age, income and education were evaluated and adjusted in the models.

Results: Hispanic women were more likely to have high PASS scores than the other racial/ethnic groups. Odds ratios indicate that subjects with high levels of PASS were significantly less likely to be sedentary than those with low support, even after adjusting for race/ethnicity. While there were significant associations among levels of social support and physical activity, this was not true for the measure of “regular exercise.” There was no significant difference between the contribution of “friend” support versus “family” support on all four measures on physical activity.

Discussion: Based on our results, enhancing social support may be an important aspect of interventions aimed at increasing physical activity in a population of sedentary women of various racial/ethnic backgrounds. Also, “regular exercisers” in this population appear to be less reliant social support to maintain their behavior. © 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Physical activity; Social support; Minority; Women

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Introduction

Decades of research indicate that physical activity is an important behavior for health promotion and disease prevention. Specifically, physical activity contributes to health benefits such as lower risk of cardiovascular disease (Paffenbarger et al., 1978; Blair et al., 1993; United States Department of Health and Human Services, 1996) better control of hypertension (Stamler et al., 1989; Folsom et al., 1990; Paffenbarger et al., 1991) and diabetes mellitus (Helmrich et al., 1991; Kaye et al., 1991; Bernstein et al., 1994), and lower risk of osteoporosis (Chow et al., 1986; Dalsky et al., 1988). Despite widespread dissemination of information supporting the health benefits of physical activity, the proportion of sedentary Americans has changed very little in the past 15 years (United States Department of Health and Human Services, 1995).

Almost one quarter of all American adults are completely sedentary, and over half do not exercise regularly (Pate et al., 1995). The first-ever Surgeon General’s Report on Physical Activity and Health summarized salient research on the benefits of physical activity and emphasized the need for more research, interventions, and policies promoting an increase in the nation’s physical activity level. This particular report provided an alarming trend toward disparate risks based on gender, selected socio-demographics, and racial/ethnic background.

These data are particularly interesting as it is clear that for some minority groups, rates of physical activity are virtually unknown. For example, there are no national measures of physical activity prevalence among American Indian/Alaskan Native or Asian/Pacific Islander women in the United States. However, the limited information available suggests lower rates than among Whites (Centers for Disease Control and Prevention, 1994). From data that are available, Black women have the highest rates of physical inactivity compared to Hispanic and white women (Caspersen and Merritt, 1995). According to 1994 National Behavioral Risk Factor Surveillance Survey Data (BRFSS), a US ongoing study collecting risk factor data from 135,000 adult annually (see Remington et al., 1988), 46% of non-Hispanic Black women were physically inactive (Brownson, Heath et al., in review). Nearly as many (44%) of Hispanic women were physically inactive (Brownson, Heath et al., in review).

Physical activity and social support

Although there has been much speculation over factors that may contribute to this apparent disparity in physical activity levels, there are many unanswered questions. Several literature reviews have identified many determinants of physical activity (Dubbert, 1992; King et al., 1992; Dishman and Sallis, 1994). One possible determinant that has received little attention to date is the relative contribution of social support to physical activity behavior. To some degree, social support from family and friends has been consistently and positively related to adult physical activity (Treiber et al., 1991; Sallis et al., 1992a; Dishman and Sallis, 1994; Felton and Parsons, 1994). This social support typically is related to tasks or steps that significant others take to facilitate behavior. For example, social support for physical activity can be instrumental (e.g. giving a non-driver a ride to an exercise class); informational (telling a neighbor about a community exercise program); emotional (e.g. calling a friend to see how their new exercise program is faring); or appraisal (e.g. providing encouragement or reinforcement for learning a new activity or skill) (Isreal and Schurman, 1990).

Family support appears to be especially important. Rakowski (1988) concluded that the success of interventions to modify health practices seems especially dependent on the family environment (Gottlieb and Green, 1987; Rakowski, 1988). However, families may not “naturally” provide social support for health changes and families must be directly and indirectly taught how to provide it in order to strengthen interventions (Baranowski et al., 1982).

Spousal social support also may increase levels of physical activity. Several intervention studies exemplify this in both exercise (O’Reilly and Thomas, 1989; Wallace et al., 1995) and cardiac rehabilitation (Godin and Shepard, 1985; Daltroy and Godin, 1989).

In addition to support from family members and spouses, friend support seems to play a significant role in physical activity participation (King et al., 1990; Courneya and McAuley, 1995). For some groups of people, the mere social contact that occurs during a structured exercise program may enhance physical activity participation. Social interaction during exercise was found to be an important determinant for exercise in women (Gilette, 1988). Focus group studies conducted with women of various racial/ethnic groups found that the social aspect of group physical activity is a motivating factor for commencing or maintaining a physical activity habit (Clark, 1996; Eyler et al., 1998).

The purpose of this study was to identify the relationship of social support for physical activity in a population-based sample of racial/ethnically diverse women. Overall support, as well as support from friends versus relatives were analyzed. The questions on physical activity-related social support (PASS) were part of a national survey of risk factors among women.
Methods

The US Women’s Determinants Study was a national telephone survey conducted from July 1996 to June 1997. Hispanic, Black, and American Indian/Alaskan Native women over age 40 were the focus of this study. A sample of White women was also surveyed for comparison purposes. A modified-random cluster sampling technique was used. In order to use our resources most efficiently, separate lists of zip codes with greater than 20% of the minority group of interest was compiled from 1990 US Census data. These lists were the basis for deriving the random phone numbers. For the sample of White women, a straight random digit dialing technique was used. (Waksberg, 1978). For a more detailed description of this sampling plan, see Brownson et al. (Brownson, Eyler et al., 1999). The physical activity social support questions were derived from (Sallis et al., 1987). While this original physical activity social support scale has been tested as valid and reliable (Sallis et al., 1987; Sallis et al., 1992a; Sallis et al., 1992b), the questionnaire was shortened and altered to fit our population (minority women) and survey method (telephone). The sampling and survey method was pilot tested (47), analyzed and revised. During the actual survey, an attempt was made to re-interview every 10th respondent for reliability analysis. Two hundred respondents were re-interviewed and data were analyzed for measure of agreement from the first interview to the second.

Analysis

The PASS scale consisted of five questions with four response choices ranging from “strongly agree” to “strongly disagree”. The first question focused on general PASS. The second and third questions (defined as “friend PASS”) focused on the encouragement from friends to exercise and the availability of at least one friend who would commit to exercise with the respondent. The fourth and fifth questions (defined as “family PASS”) focused on the encouragement from relatives to exercise and the availability of at least one relative who would commit to exercise with the respondent. Responses to each question were dichotomized (0 or 1) and added together resulting in a scale score ranging from 0 to 5. Separate scores for the friend and family PASS scores were also calculated.

A frequency of the total PASS scores were run, and divided into tertiles: high support (a score of 4–5), medium (a score of 2–3), and no/low support (a score of 0–1). This variable served as the independent variable in the analyses. For the odds ratio calculations, the no/low support category was used as the referent category.

Several logistic regression analyses were conducted using four different measures of physical activity as the dependent variable. The first dependent variable was a measure of participants who were sedentary (SEDENTARY). A sedentary person was defined as someone who reported no participation in exercise, sports, or physically active hobbies in the past two weeks. In a second regression, the dependent variable was a measure of regular exercise (REGULAR EXERCISE). “Regular exercise” was calculated using self-reported participation in leisure-time physical activity at least 5 days a week for at least 30 min per session. A third regression was done using another method of assessing regular physical activity as the dependent variable (CUMULATIVE EXERCISE). A cumulative total of leisure-time physical activity minutes was calculated from responses to the series of leisure-time physical activity questions on the survey. Based on the CDC/ACSM recommendation (Pate et al., 1995) of accumulating ≥ 30 min of activity “most” (interpreted for this study as 5 days of the week), a dichotomous variable was created. This variable was coded as 1 if the subject participated in at least a cumulative total of 150 min of leisure-time physical activity and 0 if the subject did less than 150 min of leisure-time physical activity per week. Note that this variable uses total minutes, not number of days as the analytic factor. For a fourth regression, an index was designed to reflect lifestyle physical activity which is done as part of daily routines. This variable (LIFESTYLE ACTIVITY) was a cumulative total of physical activity from leisure, housework, and occupational categories. It was coded as 1 if the subject completed at least 300 min of total activity per week and 0 if the subject did less than 300 min per week. Housework activities included vacuuming/mopping, lifting/carrying, digging/planting, and “other” vigorous household chores. Occupational activity included walking, lifting/carrying, or “other” vigorous tasks completed at work. Because these activities are more likely to be less intense than leisure-time activities or exercise, the number of minutes required for meeting this criterion was double that of solely leisure-time physical activity to make up for presumably lower intensity.

These dependent variables were used for various reasons. “REGULAR EXERCISE” follows traditional exercise definitions of sustained physical activity used by the US Behavioral Risk Factor Surveillance System Survey. “CUMULATIVE EXERCISE” represents the
more recent guidelines for accumulated leisure-time activity. “LIFESTYLE ACTIVITY”, includes non-traditional physical activity (household chores and occupational activity) rather than the sole use of leisure-time physical activity which is possibly more appropriate given the population of middle aged and older women of various race/ethnicity.

Separate logistic regressions were computed with the four dependent variables stated above, using the PASS score as the independent variable. In order to present properly adjusted odd ratios, potential confounders (race, marital status, age, education, and income) were tested and only included in the final model if the original odds ratios changed by 10% or more (referred to as “substantial” change in the rest of this report)

### Table 1

<table>
<thead>
<tr>
<th>Age</th>
<th>White</th>
<th>Black</th>
<th>AI/AN</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>40–49</td>
<td>287 (43.5)</td>
<td>268 (35.0)</td>
<td>258 (34.6)</td>
<td>307 (41.6)</td>
</tr>
<tr>
<td>50–59</td>
<td>190 (28.8)</td>
<td>195 (25.4)</td>
<td>168 (22.6)</td>
<td>207 (28.0)</td>
</tr>
<tr>
<td>60–69</td>
<td>142 (19.3)</td>
<td>171 (23.0)</td>
<td>142 (19.3)</td>
<td>119 (18.0)</td>
</tr>
<tr>
<td>70+</td>
<td>307 (41.6)</td>
<td>146 (18.9)</td>
<td>145 (18.9)</td>
<td>82 (11.1)</td>
</tr>
</tbody>
</table>

### Table 2

<table>
<thead>
<tr>
<th>Total</th>
<th>White</th>
<th>Black</th>
<th>AI/AN</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedentary&lt;sup&gt;a&lt;/sup&gt;</td>
<td>37.5</td>
<td>41.3</td>
<td>45.5</td>
<td>32.0</td>
</tr>
<tr>
<td>Regular exercise&lt;sup&gt;b&lt;/sup&gt;</td>
<td>11.4</td>
<td>7.2</td>
<td>10.8</td>
<td>16.7</td>
</tr>
<tr>
<td>Cumulative exercise&lt;sup&gt;c&lt;/sup&gt;</td>
<td>25.2</td>
<td>18.0</td>
<td>19.0</td>
<td>33.5</td>
</tr>
<tr>
<td>Lifestyle activity&lt;sup&gt;d&lt;/sup&gt;</td>
<td>76.9</td>
<td>71.7</td>
<td>77.8</td>
<td>81.9</td>
</tr>
</tbody>
</table>

<sup>a</sup> Sedentary is defined as a “no” response to the question “Have you participated in any exercises, sports, or physically active hobbies in the past two weeks?”.

<sup>b</sup> Regular exercise is defined as at least 5× a week, at least 30 min per session.

<sup>c</sup> Cumulative exercise is defined in this study as an accumulation of 150 min of participation in exercises, sports, or physically active hobbies per week.

<sup>d</sup> Lifestyle activity criterion is met if participant accumulated 300 min of combined exercises, sports, physically active hobbies, vigorous household chores, or occupational physical activity per week.

Landis and Koch (1977) have suggested adjectival ratings for $\kappa$ in the following categories: 1.0–0.8 (almost perfect), 0.8–0.6 (substantial), 0.6–0.4 (moderate), 0.4–0.2 (fair), 0.2–0.00 (slight), and 0.0 to –1.0 (poor) (Landis and Koch, 1977). The $\kappa$ for the physical activity social support questions ranged from 0.36 to 0.55, the whole scale had a $\kappa$ of 0.40. Cronbach’s $\alpha$ was used to measure internal consistency. The internal consistency of the whole scale of physical activity social support questions was Cronbach’s $\alpha = 0.70$ which is considered to be adequate.

### Results

Basic socio-demographics are listed in Table 1. The total population for analyses was 2912. Ninety-three cases were omitted due to missing age or race/ethnicity data. The response rate (calculated using the method recommended by the Council of American Survey Research Organization (CASRO) for the US Women’s Determinants Study was 91% (White, 1983). From the reliability re-interviews ($n=200$) Cohen’s Kappa ($\kappa$) statistic for the physical activity social support questions were calculated (Cohen, 1960). As a reference,

Landis and Koch (1977) have suggested adjectival ratings for $\kappa$ in the following categories: 1.0–0.8 (almost perfect), 0.8–0.6 (substantial), 0.6–0.4 (moderate), 0.4–0.2 (fair), 0.2–0.00 (slight), and 0.0 to –1.0 (poor) (Landis and Koch, 1977). The $\kappa$ for the physical activity social support questions ranged from 0.36 to 0.55, the whole scale had a $\kappa$ of 0.40. Cronbach’s $\alpha$ was used to measure internal consistency. The internal consistency of the whole scale of physical activity social support questions was Cronbach’s $\alpha = 0.70$ which is considered to be adequate.

Table 2 lists the percentage of women in the four measures of physical activity by racial/ethnic group. American Indian/Alaskan Natives had the highest percentage (46%) of sedentary behavior among all racial/ethnic groups. Seventeen percent of Hispanic women in the sample met the criterion for regular exercise as opposed to 7% of Black women. Hispanic women and White women (34% and 31%) had higher percentage of women who met the criterion for CUMULATIVE EXERCISE than Black and American Indian/Alaskan Native women (18% and 19%). At least 72% of women in all the racial/ethnic groups met the LIFESTYLE ACTIVITY criterion.

Table 3 lists the frequency of women in the PASS categories by race/ethnicity. Chi square statistics indicate a significant difference among the racial/ethnic groups for the total PASS score, Family PASS, and Friends PASS. For the total PASS Score, the Hispanic group in this sample had the largest percentage (56%) of women in the “high” PASS category (i.e. a PASS score of 4–5), followed by American Indian/Alaskan Native women with 54% in the “high” PASS category.
For the Family PASS Score, 58% of Hispanic women in the sample fell in the "high" category as opposed to 42% of White women. For the Friend PASS Score, Hispanic, Black, and American Indian/Alaskan Native women (49%, 48%, and 46%, respectively) all had a significantly higher percentage than White women (39%) in the high PASS category.

Unadjusted odds ratios (OR) and 95% confidence intervals by race/ethnicity are listed in Table 4. There were significant differences among PASS categories for Black, American Indian/Alaskan Native, and White groups. The majority of the odds ratios were significant for the "SEDENTARY" variable, but only one was significant for the "REGULAR EXERCISE" variable (medium compared to no/low support for the American Indian/Alaskan Native group). Odds Ratios indicated no significant differences in the relationship of PASS category on the "CUMULATIVE"

Table 3
Frequency of physical activity social support (PASS) categories by race/ethnicity from the US Women’s Determinants Study, 1996–1997

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Total</th>
<th>Black</th>
<th>AI/AN</th>
<th>Hispanic</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>PASS score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No/Lo</td>
<td>430 (15.4)</td>
<td>107 (15.0)</td>
<td>105 (15.1)</td>
<td>68 (10.6)</td>
<td>150 (20.2)</td>
</tr>
<tr>
<td>Med</td>
<td>958 (34.3)</td>
<td>248 (34.7)</td>
<td>217 (31.2)</td>
<td>216 (33.8)</td>
<td>277 (37.4)</td>
</tr>
<tr>
<td>High</td>
<td>1402 (50.3)</td>
<td>359 (50.3)</td>
<td>374 (53.7)</td>
<td>355 (55.6)</td>
<td>314 (42.4)</td>
</tr>
<tr>
<td>x^2 = 39.3 Sig. = &lt; 0.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4
Unadjusted odds ratios for measures of physical activity by PASS category among racial/ethnic groups, US Women’s Determinants Study, 1996–1997 (OR (95% CI))

<table>
<thead>
<tr>
<th></th>
<th>Black</th>
<th>American Indian</th>
<th>Hispanic</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEDENTARY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PASS No/Lo</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Med</td>
<td>0.47 (0.30–0.75)</td>
<td>0.71 (0.45–1.14)</td>
<td>0.81 (0.46–1.42)</td>
<td>0.46 (0.30–0.70)</td>
</tr>
<tr>
<td>High</td>
<td>0.37 (0.24–0.58)</td>
<td>0.43 (0.28–0.67)</td>
<td>0.70 (0.41–1.19)</td>
<td>0.43 (0.28–0.64)</td>
</tr>
<tr>
<td>REGULAR EXERCISE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PASS No/Lo</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Med</td>
<td>0.75 (0.32–1.76)</td>
<td>2.64 (1.07–6.87)</td>
<td>1.24 (0.58–2.64)</td>
<td>1.20 (0.66–2.18)</td>
</tr>
<tr>
<td>High</td>
<td>0.95 (0.44–2.09)</td>
<td>2.12 (0.88–5.18)</td>
<td>1.16 (0.56–2.39)</td>
<td>0.75 (0.40–1.39)</td>
</tr>
<tr>
<td>CUMULATIVE EXERCISE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PASS No/Lo</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Med</td>
<td>1.11 (0.60–2.05)</td>
<td>1.42 (0.73–2.76)</td>
<td>0.92 (0.82–2.96)</td>
<td>1.49 (0.96–2.31)</td>
</tr>
<tr>
<td>High</td>
<td>1.37 (0.77–2.44)</td>
<td>1.80 (0.97–2.75)</td>
<td>1.05 (0.61–1.82)</td>
<td>1.35 (0.87–2.08)</td>
</tr>
<tr>
<td>LIFESTYLE ACTIVITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PASS No/Lo</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Med</td>
<td>1.76 (1.10–2.84)</td>
<td>1.64 (0.98–2.75)</td>
<td>1.54 (0.80–2.96)</td>
<td>1.07 (0.68–1.70)</td>
</tr>
<tr>
<td>High</td>
<td>2.58 (1.63–4.08)</td>
<td>2.29 (1.41–3.73)</td>
<td>1.68 (0.91–3.12)</td>
<td>1.56 (0.98–2.48)</td>
</tr>
</tbody>
</table>
EXERCISE” variable. American Indian/Alaskan Native and Hispanic women in the medium PASS category were significantly more likely to meet the criterion for the “LIFESTYLE” variable.

Table 5 lists the unadjusted and the adjusted odds ratios for the total population in the study. Participants in the medium or high support categories were much less likely to be sedentary than those with no/low support (OR = 0.57 and 0.47 respectively). When race was added as a potential confounder, the odds ratios became 0.36 and 0.33, and remained significant. Since the odds ratios changed by more than 10%, race was left in the physical activity social support model for sedentary behavior. Adding marital status, age, education, or income, did not substantially change these odds ratios. For REGULAR EXERCISE, the unadjusted odds ratios indicated that there were no significant differences among the categories of PASS. For “CUMULATIVE EXERCISE”, odds ratios were 1.25 for the medium and 1.37 (significant) for the high support categories. Of the potential confounders, race had a substantial effect on the odd ratio for the medium support category (OR = 1.48) so it was added to the model for “CUMULATIVE EXERCISE” variable. Marital status, age, education, or income had no substantial effect. For “LIFESTYLE ACTIVITY”, participants in the high support category were twice as likely to have completed 300 min of total weekly activity compared to those in the no/low category. When race was added to the model, odds ratios changed substantially. The odds ratios for this variable also changed substantially when both age and income was added, resulting in adjusted odds ratios of 1.21 for the medium and 1.55 (significant) and high support categories.

Another focus of the analysis was to determine if there was a difference in the four measures of physical activity between physical activity-related social support from relatives and physical activity-related social support from friends. Both “friend” and “family” social support had similar odds ratios in all four physical activity measures. All but the “REGULAR EXERCISE” variable had significant odd ratios. All the odds ratios for the “friend support” fell within the confidence intervals for “family support” indicating little difference between the two in this analysis.

Discussion

As expected, those with low physical activity social support were more likely to be sedentary. This remained true when marital status, age, income, and education were considered. Our finding is consistent with the limited research in this area conducted with minority women (Clark, 1996; Eyler et al., 1998 ).

Social support specific to physical activity may provide the initial motivation to increase physical activity levels. Promoting social support from friends and family as a component in physical activity interventions for sedentary women may be advantageous.

Unlike the sedentary variable, there was no difference in regular exercise participation among the three levels of physical activity related social support. Perhaps once a regular routine of exercise is established, participants may no longer rely on external mo-
tivating factors to continue their behavior. While women may rely on the social support from others to initiate a new behavior such as exercise, the role of social support may shift as this behavior becomes a habit.

For the “CUMULATIVE EXERCISE”, those with high support were significantly more likely to accumulate at least 150 min of leisure-time physical activity a week than those in the no/low support category. While most of the participants who accumulated 150 min of physical activity did not meet the stringent criterion for “regular exercise” (5× a week for 30 min per session), they are at least minimally active. Support from friends and family seems more important than regular, sustained physical activity. For women limited by lack of time due to family and work responsibilities, perhaps short bouts of activity seem more achievable with encouragement from friends and family.

Results from the analysis with the “LIFESTYLE ACTIVITY” variable demonstrated a pattern similar to that of the “CUMULATIVE EXERCISE” variable. Subjects with high levels of PASS were 1.5× as likely to complete 300 min of total activity per week. This finding may have important implications in physical activity interventions for several reasons. First, promotion of increased daily physical activity rather than solely leisure-time physical activity may be very appropriate for this population. While this measure of total activity may not come replete with the cardiovascular benefits of sustained physical activity or the stress-relieving benefits associated with leisure-time physical activity, it is reasonable to assume that subjects who complete more total physical activity per week experience at least some health benefits of being physically active. Completing vigorous household chores and occupational activity (as opposed to being sedentary) may enhance the ability and stamina to carry out basic activities of daily living. Second, promoting support and encouragement for all types of physical activity (leisure, occupational, and housework) may help women initiate and maintain a more physically active lifestyle.

Additionally, our results suggested that there were no differences between PASS from friends versus that from family on each measure of physical activity for the population sub-groups under study. Perhaps for this population, the fact that some social support exists is more important than from whom this support comes. Interventions should focus on creating a supportive atmosphere for physical activity both in the home and in social circles of participants in order to increase the chances of successful behavior change. This concept needs to be explored further using more in-depth assessments of the type and frequency of such support.

Limitations

There are limitations to this study. First, there is a limitation in assuming causality in a cross-sectional study such as this one. Second, there are several limitations inherent in any research with minority groups. With minority research, it is difficult to generalize results from sub-groups and sub-cultures of a population. For instance, American Indian tribes are very different from one another (e.g. reservation vs. urban living environment) (Tom-Orme, 1995). What may be a physical activity barrier to women living on a reservation may not be relevant to those living in urban settings. Also, level of acculturation may make it difficult to generalize results. A woman who is a recent immigrant to the United States may have different attitudes about physical activity or difficulty expressing these attitudes due to language barriers than a woman of the same ethnicity that was born in the United States (Eyler et al., 1998). Since our survey was only conducted in English, approximately 8.8% of the eligible women reached were not surveyed due to language barriers.

Another limitation of this study was the method of data collection. The survey data was collected via telephone and thus the sample was limited to only those households with telephones. Telephone coverage in our sample was analyzed by racial/ethnic group. The percentage of households with telephones in the zip codes surveyed was 92% for Blacks, 86% for American Indians, 89% for Hispanics, and 93% for Whites, which is similar to that of the US population (US CENSUS 1990). Although people with telephones tend to be younger and better educated than those without, the difference between estimates obtained using phone surveys and the household interview approach has generally been found to be small (Marcus and Crane, 1986).

Additionally, because the survey had several foci, survey length inhibited us from fully assessing specific dimensions of physical activity-related social support (e.g. tangible, informational, etc.). The survey length also limited our ability to fully assess family and friend support. These are potential topics for future research.

Despite these limitations, this study has many strengths. This was the first survey of a nationally representative sample of middle and older-aged women from different racial/ethnic groups. The large sample allowed for complex multivariate analysis. Another strength is the use of multiple physical activity measures. The standards of sedentary behavior and regular exercise were based on other surveys, but the LIFESTYLE assessment is unique to this survey and may be a more appropriate measure of total activity for this population.
Summary

Our results showed that those participants with no social support or low social support for physical activity were more likely to be sedentary than those with higher levels of physical activity-related social support. Interventions that promote increased encouragement from family and friends to be physically active may have a positive impact and help initiate behavior change. Our finding suggest that those with higher levels of physical activity related social support were more likely to accumulate 150 min or more of moderate intensity physical activity per week. Social support to be physically active may be an important aspect of interventions geared toward achievement of this recommendation. When designing physical activity programs for the worksite, community center, or place of worship it is important to tap into the already-existing social networks. These networks can be a catalyst to behavior change. Examples of ways to incorporate social support into physical activity interventions using such networks are: two-for-one pricing of programs, complementing exercise activities with social activities, promote “friendly” competition between departments or other existing groups, and matching participants with work-out partners.

Research on physical activity among minority women is scarce (Eyler et al., 1997). Studies such as this one are important in identifying possible determinants of physical activity in a population that has a comparatively low prevalence of this health-enhancing behavior. Also, identifying more comprehensive measures of physical activity for women of various racial/ethnic groups is an important topic for future research. These determinants can then be used to plan and implement successful interventions.

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