Modes and Locales of Physical Activity: Older Adults

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Abstract

Older adults are important from a public health standpoint as the number and proportion of elderly in our population is increasing. Further, this segment of the population is characterized by low physical activity involvement and suffers from hypokinetic diseases at high rates. Thus, health promoters should be aware of the types of PA that older adults engage in, and where that PA occurs. The purpose of this study was to describe the modes of PA in which middle-aged and older adults engage in and locales of where that PA occurs. An additional purpose was to identify predictors of meeting PA guidelines that have been created by experts. We also sought to determine if participation in social activities predicted meeting PA guidelines, as both are important aspects of aging. Knowledge of such information could be valuable in designing PA interventions. Methods: The study design was cross-sectional and all data was collected via a telephone interview. A racially mixed sample of 350 females and 199 males completed a 52-item survey that included measures of PA behavior and neighborhood characteristics. Twenty participants failed to report their gender and were excluded from the analysis. Logistic regression was used to identify predictors of meeting PA guidelines. Results: Participant ages ranged from 45-89 years ($\underline{M}$ = 60.8). The most frequently cited mode of PA was walking, by 53.7% of the sample, most of which occurred near residences (63.6%). Only 11.2% of participants met PA guidelines by doing either moderately or vigorously intense PA. Predictors of meeting PA guidelines included doing PA in a community facility or fitness club, and participation in social activities, which approached significance. Public health personnel should recommend activities, especially walking, to older adults that can be done near their homes, and future research should assess neighborhood characteristics that are supportive of, or hinder the PA of older adults.

Keywords: Physical activity, correlates, neighborhood, modes, adults.

Introduction

The value of physical activity as a health promoting behavior is evidenced by the findings presented in the Surgeon General's 1996 report on physical activity and health (US Department of Health and Human Services, 1996). Benefits associated with PA participation are also summarized in a recent report and include attenuated risks of heart disease, certain cancers, Type II diabetes and osteoporosis (Haskell et al., 2007). An additional and important benefit of PA for older adults is that PA is associated with preventing falls and fall related injuries. Falls are frequent among the elderly and often cause health problems that result in expensive medical remedies (Carter, Kannus, & Kahn, 2001). Physical activity has also been shown to reduce functional limitations (Keysor, 2003) and attenuate mild to moderate anxiety and depression among the elderly (Brosse, Sheets, Lett, & Blumenthal, 2002).

Despite the release of scientific reports that document health benefits associated with regular participation in PA and evidence that many Americans are aware of guidelines for PA and benefits associated with PA (Morrow et al., 2003), the majority of Americans and especially older adults, those 45 years of age and older, do not meet PA guidelines (Nelson et al., 2007; Physical activity and health: a report of the surgeon general., 1996; Thompson et al., 2003). Data indicate that 46.4% of older adults do not

engage in light or moderately intense physical activity, while only about one-fourth (26.1%) are regularly active in those types of PA for at least 30 minutes, five or more days per week. Participation in vigorous PA is even more infrequent as only 16.2% of older Americans meet guidelines for this type of PA (Kruger, Carlson, & Buchner, 2007). These PA participation rates are well below guideline levels presented in the literature (Haskell et al., 2007; Healthy People 2010: Objectives, n.d.)

It would be beneficial for those in the public and community health fields to know what types of PA older adults engage in, and where that PA occurs (King et al., 2005). Such information could be valuable in prescribing PA for the elderly and potentially help in creating environments that encourage older adults to be physically active (McGinn, Evenson, Herring, Huston, & Rodriguez, 2007).

Although social support for PA has long been studied, mostly in the context of children being supported by their parents (Sallis & Hovell, 1990), it appears that little research has been done on whether involvement in social activities are related to engaging in physical activity. One study has shown that widows who have few friends and are not members of associations are less likely to be walkers than those with healthy friendships and who are involved with organizations (Grimby, Johansson, Sundh & Grimby, 2008). This finding suggests that a subtle approach, encouraging social activity to improve physical activity, may be effective. Therefore purposes of this study were to describe what types of PA that the elderly engage in, and where that PA occurs. Other purposes were to identify predictors of meeting PA guidelines among older adults, and to assess the association of physical activity and social activities.

Methods

Participants and Procedures

A random digit dialing phone survey, targeting citizens aged 45 years and older who lived in a large southwest city, was conducted. A 52-item questionnaire was approved by the Institutional Review Board of the sponsoring university. All phone calls were made from a university-based center by interviewers who were trained in the study protocol. Calls took place Mondays through Fridays from 10:00 a.m. to 7:00 p.m., and occurred from mid-April through mid-May of 2005. This project was funded by the city's Parks and Recreation Department (PRD).

Upon the phone being answered it was requested that the person who was 45 years of age or older and had most recently celebrated a birthday respond to questions regarding their PA behavior. Potential respondents were told that the interview would take about 15 minutes, that they could refuse to answer any question, and that they could end the call at any time. Only one person per phone number was questioned and a maximum of three attempts per phone number were attempted.

Measures

Questionnaire items requested information regarding types of PA that had been offered through organized programs by the PRD during the previous year. The activities included aerobics, badminton, basketball, biking, bocce ball (a game similar to lawn bowling), dancing, golf, running, soccer, softball, swimming, tennis, walking, water aerobics, weight lifting and yoga. Participants could report engaging in any or all of these activities.

Respondents reporting participation in any of these physical activities were next asked where that PA usually occurred. The choices of locations were: park or community center, private fitness club, home, apartment complex, school, church or "other." When "other" was selected, respondents were asked to name the specific location where that activity occurred. Because several (n = 25) respondents reported "neighborhood" in the "other" category and the responses of "home" and "apartment complex" describe places near people's homes, these three response categories were collapsed into a "neighborhood" variable. The item used to measure overall PA is similar to that used in Behavioral Risk Factor Surveillance System. The validity of that questionnaire item is described as "moderate" (Nelson, Holtzman,

Bolen, Stanwyck, & Mack, 2001). Additional questions related to price, appeal, attractiveness, hours, safety and crowding at the PRD activity centers were asked. Data on those variables are not presented in this manuscript.

Participants reported their current PA behavior by selecting the statement that best described their current PA behavior. The choices were: 1) no regular PA and no intention to begin exercising; 2) no current PA but plan to begin within six months; 3) infrequent exercise; 4) vigorous PA less than three times per week; 5) moderate PA less than 5 times per week; 6) moderate PA five or more times per week or; 7) vigorous PA three or more times per week. Those people who selected numbers six or seven were identified as meeting PA guidelines (Martin, Morrow, Jackson, & al., 2000; Physical Activity for Everyone: Recommendations: How Active do adults need to be to gain some benefit? n.d.). Information regarding the age, race, gender and educational attainment of participants were also collected, as these factors have been shown to influence PA (Sallis & Hovell, 1990). The educational attainment variable was dichotomized into groups of those who had or had not earned a college degree.

Respondents were also asked about participation in social activities. Specific activities assessed were membership in social and travel clubs, places of worship, community/ service groups, participation in outdoor group activities, and volunteer work. Response choices to these items were "yes" or "no." The "yes" responses to these items were totaled and were combined into a "social activity" variable, with scores ranging from 0-6. These items are similar to those used in another study and produced moderate internal consistency (.51), but were quite stable over a two year period (0 .60 or greater) (McGue & Christensen, 2007).

Data Analysis

Descriptive statistics were calculated to depict demographic characteristics of respondents as well as to identify the types of activities that were reported and where those physical activities occurred. Chi-square analysis was used to identify selected differences between categorical variables. Finally, logistic regression was run to identify predictors of meeting PA guidelines. Logistic regression is similar to multiple regression with the exception of using a dichotomous dependent variable, and dichotomous or continuous dependent variables. Race was categorized as white or non-white and was entered as a dichotomous variable (0 or 1). This grouping was done so that an odds ratio could be calculated in the logistic regression procedure. Whites were identified as the referent group. The significance level for all analyses was set at $p < .05$.

Results

A total of 2168 adults were phoned and 569 (26.2%) agreed to participate in the survey. Females comprised 61.5% of the sample (n = 350), 34.9% (n = 199) were male and 3.6% (n = 20) failed, or refused, to report their sex. Those failing to report their sex were eliminated from further analysis. Participants ranged from 45 to 89 years of age with a mean of 60.79 years (SD = 8.9). Almost one-half of the sample, 48.0%, reported an educational attainment of high school or less, 33.7% reported some college and 18.3% were at least college graduates.

A racially diverse group responded to the questionnaire. The ethnicities of the respondents are presented in Table 1. Compared with the racial make-up of the community, whites and African-Americans were overrepresented, and Hispanics were under-sampled in this study. The educational attainments of the sample were similar to educational levels of the overall population of the city (North Las Vegas, Nevada, 2007).

Table 1
Participant Ethnicities

Race	N	% of sample
White	279	44.3
African-American	135	27.2
Hispanic	47	9.6
Other	24	4.8
Asian-Pacific Islander	22	4.4
Mixed Race	13	2.5
American Indian	6	1.2
Race unreported	23	6.0
	549	100.00

Table 2
Description of locations: Where physical activity occurred and the proportion of PA that was completed near home

Activity	% of sample participating	% occurring near home
Walking	46.8	170/257=66.1
Swimming	17.7	62/97=63.9
Exercise/Weights	17.1	37/94=39.4
Bicycling	8.2	30/45=66.7
Dancing	6.9	21/38=55.2
Aerobics	6.4	22/35=62.8
Jogging/Running	6.2	13/34=38.2
Golf	6.0	14/33=42.4
Water aerobics	4.2	13/23=56.5
Softball	3.8	9/21=42.8
Yoga	3.8	9/21=42.8
Basketball	2.9	4/16=25.0
Tennis	1.7	1/9=11.1

The most prevalent modes of reported PA and the percent of those that occurred near residences are presented in Table 2. Nearly one-half of respondent (46.8%) reported participating in walking, swimming, and exercising with equipment were the only other modes of PA that were reported by greater than 10% of respondents although bicycling was reported by 8.2% of our sample.

Table 3
Current levels of physical activity

Physical Activity Level	Percent	N
Not active and do not plan to become active	20.2	111
No regular exercise but plan to do so	17.4	96
Infrequent walking or exercise	46.8	257
Vigorous PA < 3 X's / week or moderate PA < 4 X's / week	4.4	24
Moderate PA 4 or more X / week or vigorous > 2 X week	9.8	53
Vigorous PA > 3 X / week	1.4	8
	100.00	549

Of all locales where PA occurred, the neighborhood was the most frequently cited (42.7%), followed by park or community center (31.8%), and private fitness facilities (8.9%) (not presented). Nearly two thirds of walkers (63.7%) indicated that they did walking near their homes.

Self-reported frequency and intensity of PA was used to assess the proportion of the population that met PA guidelines. That data is presented in Table 3. More than one-fifth of the sample reported that they do not do any PA, nor did they plan to. Nearly one-half of respondents reported that they engage in walking or exercise at least infrequently. Approximately 11.2 % of respondents met recommended PA guidelines by doing either moderately or vigorously intense PA. Higher proportions of people who did PA in certain locations met guidelines. One third of those who exercised at private fitness met guidelines, 17.6% of those who exercised in a park or community center did so, and 6.8% of those who reported doing PA in their neighborhoods met guidelines. Those who did PA in their neighborhoods were actually less apt ($X^2 = 5.41$, $p = .02$) to meet guidelines than those who did not exercise near their homes. Only 1.4% of respondents met guidelines for vigorously intense PA, although 6.7% of private

fitness club members met guidelines by doing this type of PA.

Table 4
The number and percent of people involved in social activities

Social Activity	n	%
Social clubs	35	6.7
Travel groups	38	7.3
Outdoor activities	85	16.4
Family activities	218	42.0
Volunteer activities	25	4.8
Community activities	180	34.6

The frequency and percentage of people who participated in specific social activities are presented in Table 4. Overall, 57.8% of people indicated that they were involved in social activities twice or more per month.

Table 5
Regression model predicting the meeting of physical activity guidelines

Variable	B	P-value	Odds Ratio and CI
Age	-.027	.060	0.963 (.924-1.002)
Race	.461	.447	1.55 (.500-4.81)
Education	.303	.106	0.544 (.260-1.14)
Gender	.718	.125	0.586 (.296-1.16)
Neighborhood PA	.500	.266	1.51 (.730-3.11)
Member of a club	1.42	<.001	5.581 (2.26-13.89)
Socially active	-.025	.077	0.91(.633-1.20)
Park Community Ctr	.975	.007	2.65 (1.31-5.37)

Discussion

It is not unexpected to find that walking was the most frequently reported mode of PA as this has been shown elsewhere (US Department of Health and Human Services, 1996). Interestingly, among those middle-aged and older adults who do walk, many perform that activity in their neighborhoods. It is apparent from the data presented in Table 2 that several modes of PA are predominantly performed in the neighborhood. This result is in agreement with the findings of others (McGinn et al., 2007; Sallis, King, Sirad, & Albright, 2007) and suggests that when recommending PA to older adults, health promoters should consider activities, especially walking, that can be done in neighborhoods. An issue with PA that is done in the neighborhood is that even though many people do it, most of them do not perform PA at levels sufficient to meet guidelines. An implication of this finding is to encourage those people who do PA in their neighborhoods to do more of it.

In addition to being the most available and acceptable form of PA, walking is also ideal for the overweight, sedentary and elderly because of its simplicity and low threshold of physical effort (Frank & Engelke, 2003). Another reason for health professionals to promote walking is that it is the easiest mode of PA to undertake and sustain (Owen & Bauman, 1992). Such rationale supports the focus of public health interventions that recommend the promotion of walking (Sallis, Bauman, & Pratt, 1998). Because the United States has no scarcity of overweight, obese, and sedentary older citizens, it behooves public health officials to promote walking and to create opportunities for that behavior, especially in neighborhoods.

Although a relatively high proportion of the sample reported walking, and most of them reported doing that activity their near homes (66.1%), only 10.9% of those who walk met guidelines. This finding is somewhat disappointing, but is anticipated as others have shown that many walkers do not meet PA guidelines, even among those who live in the most walkable neighborhoods (Giles-Corti & Donovan, 2003; Saelens, Sallis, & Frank, 2003). Despite this finding it is still important for

people to do some walking because it has been theorized that health benefits can be garnered from sub-guideline levels. Using epidemiological methods Powell and Blair have calculated that if half of all sedentary people became even irregularly active, the number of deaths attributable to coronary heart disease would drop by up to 3.9% (Powell & Blair, 1994). Other empirical data suggests that cardiovascular deaths can be reduced by walking just 45-75 minutes per week (Manson et al., 2002) which is well below recommended guideline levels. Therefore older Americans should be encouraged to walk, even if guidelines are not met. People should however strive to meet PA guidelines because the evidence supporting health benefits from PA is stronger for those who do meet that standard (Nelson et al., 2007).

Those who use parks or community centers to participate in PA were more likely to meet guidelines than were those who did not. This finding combined with the relatively high proportion of participants who use parks and community facilities, 31.8%, indicates that these types of amenities can play an important role in providing PA opportunities for older adults. Subsequent research should assess what specific facilities and equipment are used by older adults such as walking paths, and whether or not these parks are near the homes of those who use them.

Locales where PA occurs, other than the neighborhood and parks and recreation facilities, also produced noteworthy results. About 8.9% of our sample reported being a member of a private fitness club. Even though private fitness club membership did predict the meeting of PA guidelines, only one-third of private fitness club members met those guidelines. This rate is higher than that of the remainder of the sample, of which 9.0% met guidelines ($X2 = 24.02$, $p < .001$), and suggests that club membership is associated with meeting PA guidelines. However, we might expect fitness club members to be active because it is reasonable to believe that those who are willing to expend resources and make the effort to travel to a fitness club are committed to a PA regimen, at least at the time they joined the fitness club.

A concern with expecting private clubs to contribute to increasing PA at the population level is that less than 9.0 % of our sample are members. Secondly, most (67%) club members do not meet PA guidelines and only 6.7% of them met guidelines for vigorous PA. These relatively low club membership rates and the low percentage of members who meet guidelines suggests that either many fitness club members may not regularly frequent their club, or that they are not particularly active when they do go to the club.

It was unanticipated to learn that age failed to predict meeting the PA guidelines, as an inverse relationship of age and PA is known to exist (Sallis & Hovell, 1990). One reason that age may not have predicted PA in this study is because our sample was age restricted. Therefore our findings suggest that the effect of age on PA may attenuate or disappear after people reach the age of 45 years. This phenomenon should be explored in future research.

It is also interesting to note that social activity approached significance in predicting physical activities. This finding agrees with work shows that people who are physically active are more likely to know their neighbors and have more social interactions (Frank, & Engelke, 2003), and with another study which found that having strong networks of friends and involvement in organizations is associated with PA (Grimby et al., 2008). Longitudinal studies will be required to articulate the relationship of social and physical activities.

Several limitations of this study should be considered when interpreting these findings. First operational definitions of intensity were not provided. Therefore respondents answered questions in accordance with their individual perceptions of intensity. This creates the possibility that some people could have done the same activities and perceived the intensity differently. We do not believe that this is a huge problem because intensity is by its nature subjective. While we believe that the list of physical activities is relatively exhaustive it is

possible that people could have done other physical activities that were not detected by our methods. Further, the response rate was less than desired, but similar to what others have experienced with this type of research (McCarty, House, Harman & Richards, 2006). The generalizibility of these findings to people in other parts of the country should be done with caution. Further Hispanics were under-represented in the sample, which is possibly because the survey was conducted in English only.

The present study shows that the PA of many middle-aged and older citizens often occurs near their place of residence. Thus we believe that efforts to create physical activity supportive environments that are near residences would enable a larger proportion of our older adults to be physically active and potentially meet PA guidelines. Further research that assesses particular neighborhood amenities that are predictive of PA would be valuable.

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