

## Environmental Correlates of Physical Activity Among African-American Adults

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### Abstract

The purpose of this cross-sectional study was to identify perceived environmental correlates of meeting physical activity guidelines among African-American adults living in Southern Nevada. Trained interviewers phoned potential participants who lived in the 12 zip codes of Clark County, Nevada with the highest proportions of African-American residents. Respondents (n=237) answered 52 health-related and demographic questions. Slightly less than 50% of participants met physical activity guidelines. A factor analysis procedure produced two environmental variables, neighborhood safety and environmental supports for physical activity. Age, gender and educational attainment ( $p < .05$ ) predicted the meeting of those guidelines ( $R^2 = .214$ ), while neighborhood support for physical activity, neighborhood safety, and BMI failed to do so. This finding suggests that environmental factors are not strong predictors of physical activity among African-American adults, although environmental supports for physical activity approached significance. Future studies should consider assessing additional aspects of the built environment as an influence on physical activity.

Key words: exercise, physical activity; environmental correlates; African-American

Physical activity is an important component of chronic disease prevention regimens and for the maintenance and improvement of personal health. Specific benefits associated with regular physical activity include decreased cardiovascular and coronary artery disease mortality. Habitual physical activity is also important in the prevention or reduction of hypertension and hypercholesterolemia. Further, physical activity is associated with the reduced incidence of colon cancer, Type II diabetes, obesity, osteoporosis, depression and anxiety (Haskell et al., 2007).

Despite the well-publicized benefits of physical activity many Americans are not active at desired levels, and some segments of the US population are particularly vulnerable to physical inactivity. For instance, African-American adults have been shown to be especially sedentary (Marshall et al., 2007). Consequently, African-Americans suffer from relatively high rates of chronic disease and obesity (Farmer & Ferraro, 2005). When elevated burdens of disease are demonstrated by disadvantaged groups, a health disparity is present, (Centers for Disease Control and Prevention, 2011) and eliminating such disparities is a primary goal of public health (Healthy People 2020). For these reasons African-Americans are an appropriate target for physical activity interventions.

An initial step to enhancing the physical activity behavior of any at-risk population is to identify modifiable correlates of the behavior for that group. Psychosocial and demographic factors have long been associated with physical activity (Sallis & Hovell, 1990). More recent findings have identified characteristics of the physical, or built environment, as important potential predictors of physical activity (Addy & Wilson, 2004), but little known about how these factors correlate with African-American adults behavior. While some work has been conducted to assess environmental correlates of physical activity among African-Americans it has typically been done in either large, compactly built Eastern (Rohm Young, Miller, Wilder, Yanek, & Becker, 1998) or Midwestern cities (Wilbur, Chandler, Dancy, & Lee, 2003), or in the rural south (Ainsworth, Wilcox, Thompson, Richter, & Henderson, 2003). Our review of the literature located no publications that assessed the previously mentioned correlates of physical activity in the sprawling cities of the American Southwest. Thus, the purpose of this study was

to assess the relationship of African-American adult's perceptions of their neighborhood environments and physical activity in Las Vegas, Nevada.

### Methods

This study is based on data collected from a random digit telephone survey targeting African-American adults age 18 years and older living in Clark County, Nevada. Calls were made to residents living in the twelve zip codes with the highest proportions of African-Americans. African-Americans comprised between 6.6 and 45.3 percent of residents in the identified locations (*Clark County Quickfacts from the US Census Bureau, 2009*).

Telephone calls were placed on weekdays between 10:00 a.m. and 7:00 p.m. from March 15 through June 15 of 2008. Up to three attempts were made per phone number. A maximum of one person per phone number completed the survey. Once eligibility of the household was established it was requested that the adult who had most recently celebrated their birthday respond to the questionnaire. Respondents answered 52 health-related and demographic items.

The study methods were approved by the University of Nevada, Las Vegas' Office for the Protection of Human Subjects. Because no information was requested that could be used to identify participants, and no invasive or potentially harmful information was requested, this review was "expedited."

Participants were asked to describe their current physical activity behavior by selecting one of seven statements. From least to most active, the choices were: 1) no regular physical activity and no intention to begin; 2) no current physical activity, but plan to begin within six months; 3) trying to be physically active, but such activity was infrequent; 4) vigorous physical activity less than three times per week; 5) moderate physical activity less than five times per week; 6) moderate physical activity five or more times per week or; 7) vigorous physical activity three or more times per week. Construct validity for this physical activity assessment tool has been provided by Jackson and others (Jackson, Morrow, Bowles, Fitzgerald, & Blair, 2007).

Participant's physical activity classification was dichotomized based on which of the above listed seven statements they selected. Those who chose options one, two or three were labeled as not meeting physical activity guidelines, while respondents who described their behavior by choosing numbers four, five, six or seven were identified as meeting physical activity guidelines. This is a recommended method of classifying physical activity behavior (Jackson et al., 2007).

Eight items assessed perceived neighborhood characteristics. These specific questions were selected because they have been shown, or hypothesized to influence physical activity (Addy & Wilson, 2004). The items included the following perceptions: the presence of neighborhood sidewalks, and parks and recreation facilities, a nearby grocery store, the prevalence of neighborhood crime, and unleashed dogs, the heaviness of neighborhood traffic, neighbor trustworthiness, and the pleasantness of the neighborhood for walking.

Response choices to the neighborhood characteristic items were categorical (yes/no) or ordinal (Likert-type) in nature. The Likert scale scores ranged from 1-5. Participants were also asked to report their age, gender, and educational attainment because these variables are known to influence physical activity behavior (Pichon et al., 2007; Trost, Owen, Bauman, Sallis, & Brown, 2002). Educational attainment was categorized into two groups, those who had attended at least some college, and those that had not. Details of the survey and its administration are provided elsewhere (Bungum, Thompson-Robinson, Moonie, & Lounsbury, 2011).

Factor analysis was used to establish construct validity of the neighborhood characteristics. Items with factor loadings of  $>.40$  were retained in the statistical models (Norman & Streiner, 1994). The principal component analysis identified two environmental factors. Four questionnaire items, including perceptions of crime, pleasantness of the neighborhood for walk, neighbor trustworthiness, and the heaviness of motorized traffic loaded on the factor, "neighborhood safety." Items that loaded on the other component, "perceived environmental physical activity supports" (PEPAS), included the presence of sidewalks, recreation facilities, and a nearby grocery store. Because the perceived

presence of unleashed dogs did not load on either factor at  $\geq .40$ , it was not included in subsequent analyses.

Multiple logistic regression was used to identify predictors of meeting or not meeting physical activity guidelines. Variables entered in the regression models included PEPAS, neighborhood safety, body mass index, marital status, educational attainment, employment status, gender and age. For the logistic regression, BMI was categorized into three groups,  $<25$ ,  $\geq 25 - <30$ , and  $> 30$ . These categories correspond with standard classifications of normal, overweight and obese status (Healthy People, 2020) respectively. Age was categorized into three groups, 18-35, 36-55 and  $>$  than 55. The presence of interactions of age and gender with other the other independent variables were assessed, and none were found. Alpha level for all analyses was  $<.05$ .

**Results**

The questionnaire was completed by 237 African-American adults. Mean participant age was 50.9 (SD=18.8) years with a range of 18-92. One quarter (n=59) of our sample was 18-35 years of age, 30% (n=72) were 36-55 and 44.2% (n=105) were 56 years of age or older. Females comprised 65% (n=172) of the sample and about one-half of participants (48.5%) had attended at least some college, including 13.5% who were college graduates. Approximately one-third (34.0%) of the sample reported their health to be very good or excellent. Less than one-third (31.6%) were married, and approximately 29% were employed.

Body mass indices ranged from 18.2 to 49.2 with a mean of 29.1 (SD=6.9). Almost ¼ (n=23%) of the sample was of normal weight, 37.6% were overweight and 39.6% were obese. Respondents meeting physical activity guidelines (n=110) comprised nearly one-half (46.4%) of the sample. The mean age of those meeting guidelines was 37.5 years, and 51.0 years for those not meeting physical activity guidelines. The distribution of reported physical activity behavior is presented in Table 1.

<u>Reported Physical Activity</u>	<u>n / %</u>
I do not exercise or walk and do not plan to in the next 6 months	46/19.3
I do not exercise or walk regularly but I have been thinking about it	26/11.0
I am trying to walk or exercise regularly	55/23.2
I am doing vigorous exercise less than 3 times per week	35/14.6
I am doing moderate exercise less than 5 times per week	24/10.1
I have been doing moderate exercise 4 or more times per week for the past 1-6 months	43/18.1
I have been doing moderately intense physical activity 5 or more times per week for the past 1-6 months	8/3.7

The survey items used to measure the neighborhood environment are listed in Table 2. With the exception of “living within walking distance of a grocery store,” greater than half of the sample rated all other items as being supportive of physical activity. For example, more than 90% of respondents reported having sidewalks in their neighborhood.

Results of the logistic regression procedure are presented in Table 3. Significant predictors of physical activity included gender, age, educational attainment and BMI. Perceptions of neighborhood supports approached significance (P=.077). Neighborhood safety and BMI failed to predict the meeting of physical activity guidelines. Our statistical model explained 21.4% of the variance in meeting physical activity guidelines.

Table 2

Neighborhood Characteristics

Question	% yes	n
How safe from crime do you consider your neighborhood to be? (extremely or quite safe)	51.1	121
Would you say that motorized traffic in your neighborhood is ... (light or moderate)	73.0	173
Rate your neighborhood as a place to walk? (pleasant or very pleasant)	79.8	189
Can you easily walk to a grocery store?	40.9	97
Does neighborhood have sidewalks?	94.9	227
Does neighborhood have public rec facilities?	75.9	180
Would you say that most people in your neighborhood can be trusted?	50.6	120
For walking in your neighborhood, would you say that unattended dogs are ... (not a problem at all)	48.9	116

Table 3

Predictors of Physical Activity Level

	B	OR	CI	P
N' hood Safety	.086	1.09	0.94-1.26	.236
PA supports	.208	0.95	0.64-1.02	.077
BMI	.582	1.44	.930-3.50	.081
Gender	-.282	2.04	1.21-3.73	.020
Age	-.029	4.10	2.01-8.71	.010
Ed attain	.740	2.06	1.18-3.75	.012

R<sup>2</sup>=.214

**Discussion**

We found that demographic variables were the only significant predictors of meeting

physical activity guidelines. This agrees with the hypothesis of Floyd, Taylor and Whitt-Glover (2009) who suggested that environmental factors may not be predictive of physical activity among African-Americans. Floyd and others (2009) posit that a reason for environmental factors not predicting physical activity among members of this sub-population is that much of their physical activity could be utilitarian in nature. This type of activity (e.g., walking to work) is done in the context of completing tasks of daily living. These types of activities need to be accomplished regardless of environmental barriers or available physical activity supports.

The finding that physical activity is not strongly associated with environment should be interpreted with the caveat that environmental supports approached significance. The survey items used to assess neighborhood support for physical activity include factors that would support both purposeful exercise (public recreation facilities and sidewalks) and utilitarian physical activity (a nearby grocery store and sidewalks). The presence of nearby grocery stores might be an important factor because that it the most frequent destination of utilitarian walkers (Cerin, Leslie, du Toit, Owen & Frank,

2007). Further, sidewalks have been shown to be a consistent predictor of physical activity among African-Americans (Ainsworth 2003; Fleury & Lee, 2006).

The regression of demographic independent variables produced some interesting findings, while other results were expected. Age is obviously not a variable that can be manipulated. This finding does however suggest that interventions targeting African-Americans should consider older members of this group as a focus of public health interventions. Interventions that encourage younger African Americans to remain active as they age are also recommended.

As has been shown of others (Trost et al., 2002) gender and educational attainment were among our strongest predictors of physical activity. While gender (males more active) and educational attainment (the higher educated more active) are consistent predictors of physical activity they are difficult to address by intervention. These findings suggest that females and those of lower educational attainments should be targeted for intervention.

As with all studies the present one has limitations. These limitations include the self-reporting of physical activity behavior, which is sometimes overestimated (Tucker, Welk, & Beyler, 2011; Weston, Petosa, & Pate, 1997). Further, our array of environmental factors is not comprehensive. There is an instrument (Brownson, Chang, & Eyler, 2006), that assesses a much wider range of environmental influences than the one used in this study, but produce considerable respondent burden. It would also have been preferred to have included psychosocial variables which have been shown to correlate with exercise such as self-efficacy and attitudes. However our model still explained 21.4% of the variance in meeting physical activity guidelines which is similar to what others have found (Trost et al., 2002).

This study is not without strengths. The distribution of obesity in our sample is similar to national data (DHHS, 2013). This suggests that our sample is reflective of the larger African-American population.

### Conclusion

Our findings indicate that environmental factors are not strong predictors

of physical activity among African-American adults. However it is possible that some environmental factors are correlates of physical activity in this sub-population but have yet to be identified by researchers. Factors such as whether friends and relatives live nearby or if churches are walking distance from homes should be investigated as these places could be frequent walking destinations for member of this sub-population. The inclusion of these factors could improve the explanatory power of statistical models and suggest intervention strategies.

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