Research Article

Predictors of Regular Outdoor Walking among Iranian Older Males, Shiraz, 2016

Ramin Shiraly,[1] and Vahid Keshtkar[1, *]

[1]Department of Community Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

[*]*Corresponding author*: Vahid Keshtkar, MSc, Department of Community Medicine, Shiraz University of Medical Sciences, Shiraz, Iran. Tel/Fax: +98-7132347977, E-mail: keshtkarv@sums.ac.ir

Abstract

Background: Walking is the most common type of physical activity among older people. A few studies have specifically investigated factors associated with walking behavior of elderly. The purpose of this study was to determine correlates of regular outdoor walking among Iranian males aged 65 to 75 years, living in Shiraz, Iran.

Methods: This was a cross - sectional study with a control group matched by age and gender, carried out during June to August 2016 in Shiraz, Southern Iran. Interviews with more than 900 elderly people from 11 municipal divisions of Shiraz city were carried out, and 531 eligible males aged 65 to 75 years, including 127 subjects with regular outdoor walking and 404 controls without this activity during the previous year were identified. Using a checklist, socio - demographic and environmental data were collected. Binary logistic regression was used to identify factors associated with regular outdoor walking. Statistical analyses were performed using SPSS version 19. Statistical significance was set at 0.05.

Results: Higher educational level (Adjusted Odds Ratio [AOR] = 2.15, 95% Confidence Interval [CI]: 1.28 - 3.59, P value = 0.004), married status (AOR = 4.10, 95%CI: 1.92 to 8.73, P < 0.001), family support (AOR = 2.48, 95% CI: 1.09 to 5.65, P = 0.029), absence of chronic disease (AOR = 2.07, 95%CI: 1.17 to 2.34, P = 0.004), access to walkable environments (AOR = 3.69, 95%CI: 1.76 to 7.75, P = 0.001) and safe neighborhoods (AOR = 3.11, 95%CI: 1.62 to 5.98, P = 0.001) were significantly associated with regular outdoor walking among Iranian older males.

Conclusions: Being married, having higher education and family support could predict regular outdoor walking among older people. Access to walkable and safe environments are notable environmental factors. Strategies to promote physical activity in older adults should be focused on encouraging regular walking in this age group.

Keywords: Older Adults, Physical Activity, Walking

1. Background

Walking is the most common preferred and accessible type of physical activity among older adults (1-4). Walking has beneficial effects on cardiovascular function (5); Studies have shown that regular walking is associated with decreased risk of cardiac events and longer survival in older adults (2, 6). It may also increase muscle strength and improve bone density and psychomotor function (3).

Walking activity may help elderly maintain physical and cognitive independence through the prevention of chronic conditions, such as coronary heart disease, stroke, diabetes, depression, and cancer (6, 7).

The proportion of elderly people, who do not engage in regular walking, often outweighs those, who have regular walking activity. Only about 25% of American elderly walk regularly and 27% meet recommended levels of physical activity, which is 150 minutes of at least moderate - intensity activity per week (3).

Regular walking among older people might be associated with personal, social, and environmental factors (8). Personal factors include demographic characteristics, knowledge, attitude and beliefs regarding walking, self - efficacy, and outcome expectations. Environmental determinants include sidewalks conditions, light, traffic, neighborhood safety, and presence of facilities in the surrounding environment (3).

This study aimed at addressing social and environmental factors associated with regular outdoor walking among Iranian older males aged 65 to 75 years, living in Shiraz, Iran.

2. Methods

This was a cross - sectional study with a control group matched by age and gender, carried out during June to August 2016 in Shiraz, Southern Iran. Interview with more than 900 elderly people from 11 municipal divisions of Shiraz city, found 531 eligible people including 127 subjects with regular outdoor walking and 404 controls without this activity during the previous year. Regular outdoor walking was defined as walking outside the home with the aim of promoting health at least one day per week during the previous year. Men aged 65 to 75 were enrolled in the study. Study participants were recruited from 16 different neighborhoods, which were selected by cluster random sampling, according to the municipal divisions of Shiraz city (one to two clusters were selected from 11 municipal divisions). Interviewers visited elderly males aged 65 to 75 years at their houses and public parks in every cluster and enrolled them in the study after checking for eligibility. Subjects, who were not willing to participate and those, who were unable to walk, were excluded from the study.

This research used a data collection form, including a checklist of demographic characteristics, self - reported weight and height, history of chronic medical conditions, and self - reported social and environmental factors related to regular walking.

Demographic characteristics included job status, marital status, monthly income, and educational attainment. Body Mass Index (BMI) data were calculated, according to participant's self - report of body weight and height. Validity of self - reported BMI was investigated and there was a high correlation between self - reported and actual weight and height (9). Body Mass Index was categorized according to the WHO classification: underweight (BMI < 18.5 kg/m^2), normal weight (BMI, 18.5 to < 25 kg/m^2), overweight (BMI, 25 to < 30 kg/m^2) and obese (BMI, $\geq$ 30 kg/m^2) (10), and this study considered two categories of BMI < 25 and $\geq$ 25.

Smoking status was classified as current, ex- or never - smoker. A current smoker was defined as a subject, who had smoked during the past 30 days. An ex - smoker was defined as one, who had not smoked during the past 30 days.

A chronic medical condition was defined as a prolonged disease state, for which patients received drugs and did not resolve spontaneously and was not be cured completely, such as diabetes mellitus and hypertension (11).

Participants were asked whether there were family and environmental factors that could help them engage in regular walking outside their home. They answered "yes" or "no" to the following questions: Are there walkable environments that are accessible to you for regular walking? Is your neighborhood safe for walking? Do your family and friends encourage and help you walk outdoors? Do you have a companion for outdoor walking?

Face to face interviews were performed by 3 trained interviewers. All data on variables were based on self - reported information and were collected after obtaining informed verbal consent from the study subjects.

Descriptive statistics included frequency distributions of categorical variables, such as educational attainment (< 12 and $\geq$ 12 years of schooling), marital status (married and never married, divorced or widowed), income (< 500 and $\geq$ 500 US dollar per month), smoking status (current or ex - smoker and never smoked) and Body Mass Index (< 25, $\geq$ 25).

For univariate analysis, chi - square test was used to determine Odds Ratios (ORs) and 95% Confidence Intervals (CIs).

Backward stepwise logistic regression was used to explore factors associated with engagement in regular outdoor walking among older males after adjustment for potential confounders. The SPSS version 19 was used for statistical analysis. P values of < 0.05 were considered statistically significant. This study was approved by the ethics committee of Shiraz University of Medical Sciences (Code: IR.SUMS.Med.RES.1395.s32).

3. Results

The mean ($\pm$ SD) age of cases was 68.42 $\pm$ 6.15 and of controls was 68.68 $\pm$ 6.49 (P = 0.154). Cases were more likely to be retired or housewives and having a BMI of < 25. Controls were more likely to be less - educated, single people with lower income and to be a current or ex - smoker. Less than one - third of participants reported being employed. Also, more than half of both cases and controls had normal BMI and the majority of the remainder were overweight (Table 1).

Table 2 demonstrates univariate analysis of socio - demographic and environmental factors with engagement in regular outdoor walking among the study participants. Most of the study variables, including age, gender, income, educational level, marital and smoking status, chronic conditions, family support and characteristics of environments were potential correlates (P < 0.05), yet there was no significant association between BMI (P = 0.252), job status (P = 0.209), friend's support (P = 0.252), having a walking companion (P = 0.351), and regular outdoor walking activity.

When adjusted for socio - demographic and environmental characteristics, there was a significant association between higher educational level (AOR = 2.15, 95%CI: 1.28 to 3.59, P = 0.004), marital status (AOR = 4.10, 95%CI: 1.92 - 8.73 , P < 0.001), family support (AOR = 2.48, 95%CI: 1.09 - 5.65, P = 0.029), absence of chronic disease (AOR = 2.07, 95%CI: 1.17

Table 1. Baseline Characteristics of Study Participants

Characteristics	Total Subjects (531), N (%)	Cases (127), N (%)	Controls (404), N (%)
Male gender	531 (100)	127 (100)	404 (100)
$\geq$ 12 Years of schooling	104 (19.60)	41 (32.30)	63 (15.60)
Working	202 (38.00)	42 (33.10)	160 (39.60)
$\geq$ 500 US Dollar monthly income	236 (44.4)	73 (57.50)	163 (40.30)
Married	433 (81.5)	118 (92.90)	315 (78.00)
BMI $\geq$ 25	209 (39.4)	44 (34.60)	165 (40.80)
Current or ex - smoker	222 (41.80)	38 (29.90)	184 (45.50)

- 2.34 , P = 0.004), access to walkable environments (AOR = 3.69, 95%CI: 1.76 - 7.75 , P = 0.001), and safe neighborhoods (AOR = 3.11, 95%CI: 1.62 - 5.98 , P = 0.001) and regular outdoor walking among Iranian older adults (Pseudo R^2 was 0.29 and correctly predicted percentage was 76.1%) (Table 3).

4. Discussion

Our findings indicate that educational attainment and marital status are important social determinants of regular outdoor walking among Iranian older males. Some other studies have also shown a relationship between social class and physical activity of older adults. These findings support the popular concept of social determinants of health (12-14).

Disparities between walking behavior of cases and controls cannot be explained by disparity of educational levels. Indeed, low social levels may promote the kind of lifestyle that predisposes to unhealthy behaviors, including low physical activity (15).

In the present study, married elders more commonly engaged in regular walking than did single, divorced or widowed elderly. One study also showed that married older people had higher average physical activity and exercise than those, who were single (16).

There are some reports that married and highly educated people have an increased sense of confidence, which can act as a driving force to manage health behaviors and achieve better health outcomes (17-19).

Moreover, the current study demonstrated that the presence of a chronic medical condition might have a negative effect on regular walking. Chronic diseases are associated with inadequate physical activity in older adults (20). There may be a reciprocal cause and effect relationship between physical activity and chronic medical conditions, as regular exercise correlates with a reduced risk of chronic diseases, while the latter can restrict physical activity (21, 22).

Family support was another factor that could predict engagement of older adults in regular outdoor walking. The present study showed that elderly people with positive family support had higher outdoor walking activity levels than those without, yet friends' support and need to have a walking companion were not associated with this outcome. Effect of family support on physical activity levels of older adults have been suggested in other studies (23, 24). This effect may be mediated by marital status, as physically active, married elders usually have a physically active spouse and are more likely to have family support than single, divorced or widowed elders (16). Some studies have also shown the positive influence of important others, such as friends (23, 25), yet this study did not find a significant association.

Both access to walkable environments and safe neighborhoods had a positive effect on engagement in regular outdoor walking. These findings are consistent with many other studies, which showed that characteristics of the environment is associated with physical activity levels in older adults. More walkable environments are associated with more walking and better health outcomes among elderly people (26-30).

In parallel with the current findings, it has been suggested that unsafe neighborhoods due to factors, such as traffic, excessive noise, unsafe sidewalks, and crime are more likely to be associated with lower tendency of older people to walk outdoors (31). One study showed no association between neighborhood safety and physical activity in older adults (32); yet many studies showed that perceptions of safety for walking is positively related to higher levels of walking activity (33-35).

Life expectancy has been lengthened almost linearly over the past century in most developing and developed countries and this trend is expected to be continued in the future (36). According to the national population and housing census, the proportion of Iranian elderly has increased from 7.2% in 2006 to 8.2% in 2011 and it is expected that in the coming years the elderly population will grow

Table 2. Univariate Odds Ratios and 95% Confidence Intervals for Potential Factors Associated with Engagement in Regular Outdoor Walking among Iranian Older Males, Aged 65 to 75 Years in Shiraz (Unadjusted Benefit)

Variable	Cases (N = 127), N (%)	Controls (N = 404), N (%)	OR (95% CI)	P Value
Education (years of schooling)				< 0.001
< 12	86 (67.70)	341 (84.40)	1	
≥ 12	41 (32.30)	63 (15.60)	2.58 (1.63 - 4.08)	
Job status				0.209
Working	42 (33.10)	160 (39.60)	0.75 (0.49 - 1.14)	
Retired or housewife	85 (66.90)	244 (60.40)	1	
Monthly income (US Dollar)				0.001
< 500	54 (42.50)	241 (59.70)	1	
≥ 500	73 (57.50)	163 (40.30)	1.99 (1.33 - 2.99)	
Marital status				< 0.001
Married	118 (92.90)	315 (78.00)	3.70 (1.81 - 7.59)	
Single/Divorced/Widowed	9 (7.10)	89 (22.00)	1	
BMI				0.252
< 25	83 (65.40)	239 (59.20)	1.30 (0.86 - 1.97)	
≥ 25	44 (34.60)	165 (40.80)	1	
Chronic disease				< 0.001
Yes	36 (28.30)	186 (46.00)	1	
No	91 (71.70)	218 (54.00)	2.16 (1.39 - 3.32)	
Smoking status				0.002
Current or ex - smoker	38 (29.90)	184 (45.50)	1	
Never smoker	89 (70.10)	220 (54.50)	1.96 (1.28 - 3.00)	
Access to walkable environment				< 0.001
Yes	116 (91.30)	254 (62.90)	6.23 (3.25 - 9.94)	
No	11 (8.70)	150 (37.10)	1	
Safety of neighborhood				< 0.001
Yes	111 (87.40)	236 (58.40)	4.93 (2.82 - 8.65)	
No	16 (12.60)	168 (41.60)	1	
Family support				0.026
Yes	15 (11.80)	22 (5.4)	2.32 (1.17 - 4.64)	
No	112 (88.20)	382 (94.6)	1	
Friends' support				0.252
Yes	13 (10.20)	28 (6.9)	1.53 (0.77 - 3.05)	
No	114 (89.80)	376 (93.1)	1	
Having a walking companion				0.351
Yes	12 (9.40)	52 (12.90)	1.42 (0.73 - 2.74)	
No	115 (90.60)	352 (87.10)	1	

Abbreviations: CI, confidence interval; OR, odds ratio.

more rapidly (37). In the light of this trend, public health strategies should target factors contributing to positive health outcomes among older adults. Thus, promotion of adequate physical activity, especially of walking outdoors, should be a major aim of health policy.

There were some potential limitations to this study. This research recruited cases from some limited areas of the city and this may restrict the generalizability of the results. The validity of self - reported data cannot be established and hence the collected information may be subject to bias.

It is suggested for future studies to determine factors affecting walking behavior of the eldest elderly, those aged 80 or older, who seem to be least involved in outdoor walking.

Table 3. Multivariate Stepwise (Backward Elimination) Logistic Regression of the Factors Associated with Regular Outdoor Walking among Iranian Older Males Aged 65 to 75 Years in Shiraz City (Adjusted Benefit)

Variable	β	SE	Wald	df	OR (95% CI)	P Value
Educational attainment						0.004
> 12 (years of schooling)	0.765	0.263	8.456	1	2.15 (1.28 - 3.59)	
≤ 12					1	
Job status						0.189
Working	- 0.348	0.247	1.981	1	0.72 (0.45 - 1.17)	
Retired or housewife					1	0.744
Monthly income						
≥ 500 (US dollar)	0.084	0.258	0.106	1	1.08 (0.66 - 1.80)	
< 500					1	
Marital status						< 0.001
Married	1.411	0.386	13.381	1	4.10 (1.92 - 8.73)	
Single/Divorced/Widowed					1	
BMI						0.242
< 25	0.286	0.245	1.367	1	1.33 (0.82 - 2.15)	
≥ 25					1	
Chronic disease						0.004
No	0.730	0.243	9.045	1	2.07 (1.17 - 2.34)	
Yes					1	
Smoking status						0.068
Never smoker	0.443	0.242	3.343	1	1.56 (0.96 - 2.50)	
Current smoker/Ex - smoker					1	
Family support						0.029
Yes	0.911	0.419	4.739	1	2.48 (1.09 - 5.65)	
No					1	
Friends' support						0.936
Yes	0.008	0.472	0.000	1	0.96 (0.38 - 2.43)	
No					1	
Access to walkable environments						0.001
Yes	1.307	0.378	11.932	1	3.69 (1.76 - 7.75)	
No					1	
Safe neighborhoods						0.001
Yes	1.137	0.333	11.668	1	3.11 (1.62 - 5.98)	
No					1	
Having a walking companion						0.111
Yes	0.599	0.375	2.547	1	1.82 (0.87 - 3.79)	
No					1	
Constant	- 5.780	0.658	77.136			< 0.001

Abbreviations: CI, confidence Interval; df, degrees of freedom; OR, odds ratio; SE, standard error.

4.1. Conclusions

Being married, having higher education, and family support can predict regular outdoor walking among older people. Access to walkable and safe environments are notable environmental factors. Strategies to promote physical activity in older adults should be focused on encouraging regular walking in this age group.

Acknowledgments

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