

# Assessment of Physical Activity in Adults Living in Shiraz in 2015

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## Abstract

**Background:** Physical inactivity is a modifiable risk factor for obesity, diabetes, cardiovascular diseases, and certain types of cancer.

**Objectives:** This study aimed to investigate the patterns and demographic correlates with physical activity among an urban population in Shiraz, Iran.

**Materials and Methods:** This study was a population-based cross-sectional study with a multiple-stage sampling method of 700 subjects, all over 18 years old. Physical activity was assessed through the long version of the international physical activity questionnaire (IPAQ), using face-to-face interviews with last-week recall. Participants were categorized into inactive, moderate, and intense activity categories. For data analysis, SPSS version 19 was used. Student's t-test and one-way ANOVA were also performed.

**Results:** Based on the three activity categories established by the IPAQ, 14.3% of Shiraz adults were inactive, 44.5% were active, and 41.2% had a high level of activity, but > 67.6% of the sample did not engage in any type of vigorous-intensity physical activity lasting for at least 10 minutes. Males and young people participated in more vigorous activity compared to females and older people. Married and highly educated people were more likely to demonstrate higher levels of physical activity during leisure time.

**Conclusions:** According to the results of this study, there is a need to promote various forms of physical activity, with special attention to leisure-time activities and vigorous-intensity physical activity, across both genders and all age groups, especially in jobless and poorly educated individuals.

**Keywords:** Physical Activity, Adult, Shiraz

## 1. Background

Recent findings have shown that a lack of physical activity is one of the greatest problems of human health in the twenty-first century. Available statistics show that 31% of the world population does not adhere to minimum recommendations for physical activity (1). The rapid expansion of urban societies and the consequent consumption of unhealthy foods and reduction of physical activities has led to a change from the dominance of infectious contagious disease to chronic disease (2). A world health organization (WHO) report shows that 20% of cardiovascular diseases and 10% of cardiac failures (infarcts) occur due to a lack of physical activity. The lack of physical activity is one of the 10 most common causes of death in developed countries and is therefore an important issue (3). The WHO considers almost 2 million deaths per year to be the result of physical inactivity (4). Studies of various societies have shown that physical inactivity is the cause of 6% of cardiovascular disease cases, 7% of type 2 diabetes cases, and 10% of breast and colon cancers. If the level of physical activity were increased among the population, the prevalence

of these diseases would be reduced by approximately 6% - 10%. Physical inactivity especially influences the development of colon cancer, compared to cardiovascular disease (5). The risk of death in the group with low physical activity (92 minutes weekly or 15 minutes daily) is reduced to 14% compared with the inactive group, and their life span is increased by three years. For every 15 minutes of exercise per day, the risk of death due to physical inactivity is reduced by 4%, and these benefits apply to all age and gender groups (6). Studies have shown that the mortality rate of groups who undertake physical activity during their leisure time and in their daily lives is reduced by an average of 31-35% compared to people with no physical activity, adding 2 - 4 years to the life span (7).

A study in Iran showed that 40% of adults engaged in low physical activity, and 15% engaged in none (8). Based on the American Cancer Society guidelines for the beneficial and protective effects of physical activity, adults should perform at least 150 minutes per week of moderate-intensity exercise or 75 minutes per week of vigorous-intensity exercise (9). Given the protective effects of phys-

ical activity on the risk of chronic disease, such as cardiovascular disease, cancer, and type 2 diabetes, as well as the high prevalence of these diseases in Iran, it is necessary to pay special attention to this issue. Monitoring physical activity in any society leads to better prognoses for public health (3, 10). Given the fact that no population-based study with a global standard (i.e. an international questionnaire about physical activity) in Shiraz and Fars province has ever been performed, this study used a questionnaire with proven validity and reliability (11-13).

## 2. Objectives

In this study, a questionnaire was used to examine the physical activity level of men and women in Shiraz. The results will be useful for comprehensive planning of high-level prevention of non-contagious diseases.

## 3. Materials and Methods

The present study used a cross-sectional design. The statistical populations were men and women with an age range of 18 - 65 years. The sample size was calculated equal to 625 people based on previous studies and using the sample size formula ( $\alpha = 0.5$ ,  $p = 0.5$ ,  $d = 0.4$ ) (Equation 1):

$$n = \frac{4p(1-p)}{d^2} \quad (1)$$

To enhance the accuracy of the study, the sample size was increased to 700 individuals, who were chosen randomly. The inclusion criteria were age of  $> 18$  years, residency in Shiraz in 1393, and a willingness to complete the questionnaire. The exclusion criteria were age of  $< 18$  years, physical or mental handicap, or refusal to complete the questionnaire.

In this study, a cluster random sampling method was used. In all octoploid areas of the municipality, the scope was derived and proportional to the population of each area. Some of the scopes were randomly selected, and each scope was divided into blocks, proportional to the number of families in each scope. The blocks were randomly selected, and finally the selection of families was based on the percentage of family populations in each area. After a block was selected, the easternmost street's first home was designated as number 1, and at the next chosen house, a family member over the age of 18 was questioned. In the event of unavailability of a family or refusal to complete the questionnaire, the interviewers chose a nearby house.

Defining the scope and block: each area consisted of a series of regional municipal blocks. Blocks of families side by side in square or rectangular areas were separated four ways. Each area was made up of several scopes, and each

scope was made up of a few blocks recognized by the municipality.

This study used an international questionnaire about physical activity (long form) with confirmed validity and reliability (11). Its Persian translation, in terms of validity and reliability, has also been confirmed and used previously (12, 13).

A unique feature of this questionnaire is the comprehensive evaluation of the effects on health of physical activities occurring in various situations, such as during leisure time, at the workplace, or during household chores. There are two editions of the questionnaire: a long form (27 questions) and a short form (7 questions), and there are two data collection methods for both. The first consists of in-person and face-to-face interviews, and the other is an absentia referral, such as telephone communication. Our study used the long-form questionnaire and in-person and face-to-face interviews performed by approved and trained questioners.

The questionnaire consisted of two parts. The first part related to demographic data, including sex, age, education, occupation, and marital status. The participants were divided into four groups based on age: 18 - 29 years, 30 - 39 years, 40 - 49 years, 50 - 59 years and  $> 60$  years. Education levels were also divided into four groups: illiterate elementary, middle and high school diploma, diploma and associate degree, and bachelor's degree or higher. The occupational categories included students, housewives, employees, freelancers, workers, and unemployed. The second part of the questionnaire consisted of five sections and 27 questions, including items on work-related physical activity, physical activity associated with transportation, work-related physical activity at home, home maintenance and care of family, and physical activity related to recreational, professional, and non-professional sports during leisure time.

The IPAQ considers the variety of physical activities that people engage in as part of everyday life. The questions included the times that the individual was physically active during the previous seven days, and the participants were asked about activities at work, activities at home, activities as part of the building, activities while traveling from one place to another, leisure activities, and exercise.

Based on this questionnaire, physical activity levels are classified into three groups: intense physical activity, adequate or moderate physical activity, and inactivity. Intense activity refers to activities requiring high levels of physical strength that make the individual breathe much faster than normal. Moderate activity requires medium strength and makes the individual breathe a little faster than normal. These categories were explained at the beginning of the questionnaire.

Individuals who perform a large amount of intense physical activity at least three days per week are considered to perform metabolic equivalent task (MET)-minutes/week of at least 1,500, while the sum of physical activity per week, such as walking, moderately intense physical activity, or vigorous physical activity is at least 3,000 MET-minutes/week. Moderate physical activity is considered three days or more per week of vigorous physical activity for at least 20 minutes, or five or more days per week of moderate physical activity or walking for at least 30 minutes. Or the sum of their physical activities such as vigorous physical activity, moderate physical activity or walking MET-minutes/week is at least 600. And those who are in any of the groups had moderate or high activity on the floor with little activity or were inactive.

The MET ratio is calories expended during a specific physical activity to calories expended by one person at rest. The formula for calculating MET-minutes/week for each activity is MET activity multiplied by the number of minutes per week that a person does the activity.

The obtained information was analyzed using SPSS 18. To examine the statistical data, Student's t-test, ANOVA, and the Chi-square test were used. The relationship between variables, such as different levels of activity intensity, age group, and education level, were examined using Pearson's correlation test. We considered  $P > 0.05$  as significant.

#### 4. Results

In this study, 700 residents of Shiraz were examined using the IPAQ. Two participants were excluded due to misleading data. Among the subjects, 353 (50.6%) were men and 345 (49.4%) were women. The largest age group was 18 - 29 years (38%). The most common education level was diploma or associate's degree (46%), and 56% of participants were single while 44% were married. The largest occupational groups were housewives (19.5%) and employees (19%) (Table 1).

In general, among the adult population of Shiraz, 44.5% had sufficient physical activity and 41% had high physical activity, and only 14.3% had low physical activity or none. In terms of total physical activity, there was no significant difference between the various age groups ( $P = 0.09$ ,  $r = -0.13$ ).

Age and intense physical activity were negatively correlated ( $P = 0.09$ ,  $r = -0.13$ ), showing that with increasing age, intense physical activity is reduced. Hiking ( $P = 0.09$ ) and moderate physical activity ( $P = 0.39$ ) were not significantly correlated.

Physical activity during housework ( $P = 0.01$ ,  $r = 0.13$ ) and during leisure time ( $P = 0.05$ ,  $r = -0.09$ ) was significantly

**Table 1.** Demographic Characteristics of Participants in Terms of Frequency

Variable	No. (%)
<b>Sex</b>	
Male	353 (50.6)
Female	345 (49.4)
<b>Age</b>	
18 - 29	269 (38.4)
30 - 39	193 (27.7)
40 - 49	132 (18.9)
50 - 59	85 (12.3)
$\geq 60$	19 (2.7)
<b>Education</b>	
Illiterate and primary	54 (7.7)
Under diploma	81 (11.6)
Diploma or associate's degree	325 (46.5)
Bachelor's or higher degree	238 (34.1)
<b>Marital status</b>	
Single	391 (56)
Married	307 (44)
<b>Occupation</b>	
Working	107 (15.3)
Housewife	136 (19.5)
Student	107 (15.3)
Employee	132 (18.9)
Self-employed	93 (13.3)
Retired	58 (8.3)
Unemployed	65 (9.4)

correlated with age, but physical activity during travel ( $P = 0.06$ ) and at work ( $P = 0.32$ ) were not.

Total physical activity in women and men showed no significant difference ( $P = 0.45$ ). With regard to intensity, men performed significantly more intense activity compared with women, but moderate activity ( $P = 0.5$ ) and hiking activity ( $P = 0.2$ ) had no significant correlation with gender.

In different education-level groups, the diploma or associate's degree group performed significantly more activity than the other groups, and the illiterate and primitive literacy groups had the lowest level of total physical activity ( $P = 0.02$ ). The comparison of physical activity intensity among the various educational classifications showed that individuals with bachelor's and higher degrees performed more intense physical activity compared with the

other groups ( $P = 0.02$ ). There was no significant difference in moderate physical activity between the various educational groups ( $P = 0.08$ ).

In the comparison of physical activity type (such as activity related to the workplace, to household chores, or to leisure time and sports), there was a significant difference between the low-education group (illiterate and primitive literacy) and the group with bachelor's and higher degrees (Table 2).

In terms of marital status, there was no significant difference between the single and married groups ( $P = 0.76$ ). In terms of activity intensity, there was a significant difference between married and single people, with married people having a higher average compared to single people ( $P = 0.001$ ). In type of physical activity, married people performed significantly more physical activity in their leisure time, while the activity of single people was significantly higher at home ( $P = 0.001$ ) (Table 3).

There were no significant differences among the various occupational groups in total physical activity ( $P = 0.27$ ). With regard to intensity, housewives and retired people had lower levels compared to the other occupational groups ( $P = 0.02$ ). Also, for hiking activity, housewives and unemployed people had lower levels compared to the other groups ( $P = 0.01$ ). However, for moderate physical activity, there was a significant correlation between the occupational groups ( $P = 0.14$ ). The type of physical activity differed among the various occupational groups. As expected, with regard to activity related to the workplace, the unemployed individuals, housewives, and retirees had lower levels compared to the other groups ( $p = 0.001$ ), while for activities related to household chores, housewives and retired people had higher levels ( $P = 0.001$ ).

In activities related to transportation, the retired and student groups had higher levels ( $p = 0.001$ ), and in activities related to leisure time and sports, the unemployed, retired, student, and self-employed groups had higher levels ( $P = 0.001$ ).

## 5. Discussion

In the present study, the overall physical activity of adults living in Shiraz was desirable: 41.2% engaged in high physical activity, 44.5% engaged in sufficient physical activity, and only 14.3% performed no or low physical activity. This level of physical activity is similar to the findings of a study performed in 51 countries, mostly developing, in which the prevalence of sufficient physical inactivity was estimated at 17.7% (14). In contrast, it is very different from a comprehensive study performed on 4,120 people in our country, Iran, in which the level of physical inactivity based on the GPAQ questionnaire was 40%. However,

various investigations have shown that the IPAQ questionnaire shows a higher level of physical activity compared to the GPAQ questionnaire (14, 15). Also, in that study, household chores were not evaluated, while the greatest level of activity in the present study was attributed to household chores, which can somewhat explain this difference. The results of our study are comparable with studies performed in Babol, because both identified a considerable level of higher or medium activity in the studied population (16).

Males and females showed significant differences in the average level of physical activity and walking. In most studies, higher levels of physical activity have been reported in men compared to women (17, 18). Furthermore, men had a higher level of intense activity, while women had higher levels of moderate and low-intensity activities (19). In two similar studies, men were significantly more active compared to women (18, 20).

The IPAQ instrument was used to measure different aspects of moderate physical activity, such as work done at home, keeping floors clean, transportation, and caring for babies. Since this type of physical activity is most often done by women, moderate physical activity is higher in women compared to other levels. A higher rate of severe activity events occurs among men due to societal conditions.

The study also found that men were significantly more active at the work place, while women were more active at home, which was expected due to the different employment conditions of men and women. In the present study, there was no significant association between overall physical activity level and age, though other studies have shown that physical activity declined with age (15, 18, 20-22). Also, the largest group with no physical activity in our study was those over 60 years of age, similar to a comprehensive study of 51 countries (14). A study in Iran showed that the age group of 45 - 59 years had the highest prevalence of physical inactivity, with a small difference from people older than 60 years of age (22). In this study, a negative correlation was found between intense physical activity and age, indicating that vigorous physical activity decreases with age, which is logical due to the physical limitations of older people. Also, the finding of a correlation between age and increased activity at home may be due to the increasing number of retirees and the fact that housewives are older. The same study also found that housewives and retirees performed the highest level of activity of household chores among the different groups.

In terms of education, the highest prevalence of physical inactivity was seen in the group with bachelor's and higher degrees, but other studies showed a strong negative relationship between education level and physical activity (23, 24). In our study, there was a statically significant re-



**Table 2.** Type of Physical Activity in Terms of Education<sup>a</sup>

Type of Physical Activity	Education				P Value
	Illiterate and Primary	Under Diploma	Diploma or Associate's Degree	Bachelor's or Higher Degree	
At work	506 ± 1403	1285 ± 3183	1012 ± 2657	733 ± 1603	0.36
Housework	1337 ± 2012	1508 ± 2721	1180 ± 1362	810 ± 854	0.14
In transport	447 ± 588	938 ± 1358	582 ± 888	784 ± 1042	0.08
During leisure time	283 ± 447	1132 ± 2045	1170 ± 1042	1012 ± 1781	0.001

<sup>a</sup>Values are expressed as mean ± SD.**Table 3.** Type of Physical Activity in Terms of Marital Status<sup>a</sup>

Marriage Type of Physical Activity	Single	Married	P Value
At work	918 ± 2508	898 ± 2122	0.84
Housework	1418 ± 2287	703 ± 1560	0.001
In transport	573 ± 877	724 ± 979	0.12
During leisure time	717 ± 1264	1172 ± 1651	0.002

<sup>a</sup>Values are expressed as mean ± SD.

relationship between education level and total physical activity. In terms of physical activity intensity, people with bachelor and higher degrees had more intense physical activity compared with other educational groups. There was a significant difference between the group with bachelor's and higher degrees and the illiterate group and those with a primary education. On further investigation, we discovered that this difference was due to the difference levels of intense physical activity during leisure time; people with bachelor's and higher degrees engaged in significantly more intense physical activity compared with the illiterate and primary education groups. This same observation was made in studies in the United States and Poland, in which physical inactivity was more common in people with lower literacy (25, 26). It seems that the reason for increased physical activity during leisure time in people with higher education levels is increased social levels and more attention to health.

In this study, there was no significant difference between single and married groups in overall physical activity. In other studies, the relationship between marital status and physical activity levels has rarely been discussed; however, in a study on the residents of Yazd, no significant relationship was found between physical activity level and marital status (22). However, in terms of the rate of intense physical activity in this study, there was a significant difference between married and single people. On closer examination, we found that this difference was due to more

intense physical activity during leisure time in married individuals, and this difference was more obvious in women. All of these findings are in contrast to a study performed in Poland showing that married women living in cities perform less physical activity during leisure time (26). In the present study, single individuals performed more household chores, and this difference was more obvious in men. These findings may be due to the patriarchal culture of Iranian society.

In this study, there was no significant difference between various occupational groups in terms of overall physical activity levels. The greatest level of physical inactivity (27%) was seen among unemployed people, while only 4.4% of the student participants did not have sufficient activity. In a study performed in Yazd city, the highest rate of physical inactivity was related to the employee and self-employed groups at a prevalence of 83.3% (22).

Housewives and retirees had less intense physical activity compared to other occupational groups. The average ages of the housewives and retirees were 38.9 and 54.7 years, respectively. The low level of intense physical activity in retirees can be explained by old age. The highest number of illiterates and people with primary educations was seen among housewives (approximately 20%), which may account for the lower level of intense physical activity in these individuals. Almost 68% of the adults of Shiraz performed no intense physical activity, which is comparable to a study performed in Saudi Arabia, in which 72% of people did not participate in any intense physical activity (19).

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## Footnote

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