

## Facilities and Barrier of Physical Activity in Elderlies in Kashan, Iran

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Received: May 25, 2015; Revised: June 25, 2015; Accepted: June 28, 2015

**Background:** The supplements and decreasing the limitations are important for suitable physical activity. These factors are different in various environments.

**Objectives:** The current study aimed to evaluate the facilities and barriers for physical activity in elderlies in Kashan, Iran, during 2014.

**Patients and Methods:** This was a descriptive cross-sectional study. The sample included 400 elderly people (aged more than 60 years) living in Kashan, Iran. The subjects were selected by multistage cluster sampling. They were selected randomly from healthcare centers in three regions of Kashan. The sample size was different according to gender and living area. The demographic characteristics were recorded and the exercise benefits/barriers scale (EBBS) was used. Data were analyzed using SPSS version 16. Descriptive statistics, Chi-squared test, Pearson's correlation, Student t-test, and ANOVA were used for data analysis. The significance level for all the tests was considered  $P < 0.05$ .

**Results:** Of the total elderly, 237 (59.2%) were females. The average age was  $67.6 \pm 6.8$  years. The mean of barrier and facility scores were  $103.17 \pm 21.08$  and  $70.82 \pm 18.27$ , respectively. The most important facilitating factor in 88 subjects (22%) was related to cardiovascular system health. In addition, the most important barrier was lack of suitable location, mentioned by 113 elderly (28.2%). There was a significant relationship between facility and barrier scores and the physical activity level (chi-squared = 19.91,  $P = 0.0001$ ), age ( $P = 0.001$ ,  $r = 0.01$ ), gender ( $P = 0.000$ ), marital status ( $P = 0.000$ ), educational status ( $P = 0.000$ ), personal independence ( $P < 0.000$ ), current job ( $P = 0.030$ ), and living area ( $P = 0.042$ ).

**Conclusions:** The influences of various facilities and barriers were different in the physical activity of elderly in Kashan. The promotion of active life style should be a part of health care planning in elderly.

**Keywords:** Physical Activity; Aging; Barrier; Facility

### 1. Background

The highest burden of diseases is related to chronic diseases outbreaks. As a result, disability and mortality increases worldwide (1). Physical activity is an affective factor in chronic diseases outbreaks (2). A low physical activity level is the primary cause of mortality in common diseases (3). Physical activity is an indicator in many disease incidences (4). physical activity is effective on fitness, health, muscle strength and social function (5). The lack of physical activity is one of the public health problems. It is the most important component of the successful aging theory and leads to health promotion in old ages (6). Elderlies who benefit from proper physical activities usually have high independence rates, are motived and have less vascular problems (7). Physical activity in old ages can improve family communication and social roles and decrease diseases (8).

The supplements usage as well as decreasing the limitations is important in suitable physical activity (9). The tasks, conditions and individuals, encouraging physical activity for more energy consumption and movement of skeletal muscles are called facility factors in physical activity (beneficial factors for activity). Barrier factors are the tasks, conditions and individuals causing the decrease of physical activity (10). In fact, different environments are

causative agents in physical activity, such that social, recreational, environmental, demographic and psychological factors hindering physical activity contribute to the situation (11). Related benefits and barriers are two dimensions of health belief model in physical activity (12). The most powerful predictor of behavior relates to barrier and facility factors (13). Assessing these factors helps to change the life style behaviors, in addition to promoting healthy behaviors. The barriers and benefits can potentially be separate factors related to the treatment of diseases (14). Benefits and barriers to regular physical activities are positive and negative cognitive factors, leading to performing or ignoring regular physical activity (15). The choice of changing the behavior not, related to the effectiveness of benefits and barriers in this structure, is assumed as a person who will not change his or her behavior, to provide a better understanding of the benefits and barriers (16). The move to change behavior survey costs and benefits behavior, based on action to change or not to change their behavior. In other words, the balance of the decision-making process can evaluate the cognitive aspects of positive or negative aspects of an individual's behavior (17).

Of course, activity benefits and barriers are different

among people. Age is an import factor in facility and barrier statuses (18). Physical activity will be decreased by increasing age and this will accelerate the process of aging (19). Aging largely affects people's abilities. This process changes the psychological, social, personal, and physical statuses. The body abilities decrease during the aging process (20). The age increase limits multiple conditions including psychological, social, personal, and physical statuses in physical activity. In elderly, various factors such as diseases, being poly-pharmacy and poly-medicine, visual and ear problems, and decline to enter a personal relationship affect the elderly's levels of activities. These factors have important roles in physical activity limitation (21). The report of Centers for Disease Control and Prevention in 2007 showed that 14% of elderly were 65 - 74 years old and 7% of them, who were above 75, had regular physical activity (22). A study in 2009 in Iran showed that only 13.7% of elderly in Isfahan had adequate physical activity (23).

There are various physical activity facilities and barriers in elderly (11). Rimmer et al. reported several different facility barriers related to cerebral stroke in elderly. These barriers included the cost of physical activity, the awareness of physical activity centers in the region, and lack of fitness and motivation (24). In Bjornsdottir et al. study, facility barriers included lack of light in the street, low security, financial problems and inappropriate activity programs (25). Bjornsdottir et al. showed that the most important facility barrier in elderly for physical activity was lack of suitable social environment (25). Siddiqi et al. reported shortage of time, poor promotion for physical health and probable injuries as important facility barriers for elderly's activity (26). A study in 2010 in Tehran, Iran showed that the most important facility barriers were related to hardship in meeting more people and making friends as well as being lazy (27). Various physical activity facilities and barriers change the physical activity level. Therefore, people have different levels of physical activities (28).

The evaluation of physical activity facilitating factors for suitable physical activity design should be based on age. Physical activity is a crucial part of lifestyles programs in health care. Social, cultural and climate conditions influence the physical activity facilities and barriers. According to various regions, facility barriers are different (11). The evaluation of physical activity facilitating factors in different regions can provide important data for health planners and experts interested in healthy aging issues.

## 2. Objectives

The current study aimed to evaluate the physical activity facilitating and barrier factors in elderly of Kashan, Iran, in 2014.

## 3. Patients and Methods

### 3.1. Study Population and Sampling

In this cross-sectional study, the physical activity level

in elderly and its related factors were studied. The study population included 400 elderly who were above 60 years old and had health care records in health centers of Kashan. They were surveyed using the standard exercise benefits/barriers scale (EBBS). Kashan is a warm and dry city located in the edge of a vast desert in the center of Iran with a population of 200,000. According to previous studies and the estimation of inactivity in 87% of the elderly (25) and a confidence interval of 95% ( $d = 0.05$ ,  $P = 0.87$ ,  $z = 1.96$ ), the sample size was calculated to be 261 according to Cochran's formula. It increased 1.5 fold due to cluster sampling and finally 400 participant were investigated (26). The inclusion criteria were people above 60 years old, being Iranian, no previous mental disorders (psychosis) or dementia, the ability to communicate and respond to questions, and inhabitation in Kashan city at the time of studying.

After coordination with the Health and Medical Education Department and obtaining the necessary permissions, Kashan was divided into five regions (center, north, south, west and east) based on the health map. Three regions were randomly selected. All the health care centers in these areas were entered into the study. In each health care centers, the number of elderly was determined from family records and the subjects were randomly selected based on the population covered by the center. The selected subjects were evaluated by telephone calls. If they did not meet the inclusion criteria or were reluctant to participate in the study, another subject would be replaced randomly. If the questionnaire had some missing data, the researchers would contact the subject to complete the items and if it was not possible, another subject would be replaced randomly. Thereafter, the researchers went to the residence of the subjects and after explaining the objectives of the study, the questionnaire was completed. The elderly who did not have the ability to read or write completed the questionnaire through interview.

### 3.2. Questionnaire

The first part of the questionnaire contained demographic data including variables (age, gender, education level, marital status, occupation, living area and income). The ability to move, chronic diseases, and history of participation in regular physical activity were also recorded. The second part of the questionnaire contained EBBS provided by Sechrist et al. The EBBS had 43 questions. It determines the benefits and barriers for participating in physical activity from the literature and interviews. The instrument scored the responses using the Likert-type format. This tool included the following scores: strongly agree (score 4), agree (score 3), disagree (score 2) and strongly disagree (score 1). The total score of the EBBS was from 43 to 172. The tool did not have a cut-off point. The benefits score was from 29 to 116 and the barriers score was from 14 to 56. If less than 5% of the items were answered, the response would be discarded. The resulting instrument was tested for internal consistency, validity of its constructs, and test-retest reliability. The EBBS benefit and barrier validity coef-

ficients were 0.95 and 0.80, respectively (29). The Iranian version of EBBS is a standard questionnaire, the mean of content validity index (CVI) and content validity ratio (CVR) in the questionnaire were reported 0.81 and 0.76, respectively, and the Cronbach's alpha coefficient was 0.87 (30). Using this tool for 30 elderlies, the Cronbach's alpha coefficient was calculated 0.79.

### 3.3. Ethical Considerations

The research council of Kashan university of medical sciences confirmed the study proposal. The ethical code was 197 on 25/5/2014. After receiving the necessary authorizations, oral and written consents were obtained from the participants. They assured that the data will remain confidential and will only be used for the research purposes. The participants were also given an unconditional and absolute right to withdraw from the study at any time. All the subjects received explanations about the objectives of the study and they signed the informed consents.

### 3.4. Data Analysis

The data was analyzed using SPSS version 16. The normality of the data set was analyzed by Kolmogorov-Smirnov

test and Q-Q normality plot. Since the variables of facility barrier score and age were normally distributed, parametric tests were performed for data analysis. The relationship between age and facility barrier score was determined with Pearson's correlation test. The relationship of qualitative variables such as gender, marital status, education level, physical activity level, and present diseases were evaluated with chi-squared test. The relationship between facility barrier score and qualitative variables such as gender, marital status, education level and physical activity level evaluated using Analysis of Variance (ANOVA) and Student's t-test. The significance level in all the tests was considered  $P < 0.05$

## 4. Results

Most of the participants were female, comprising 237 (59.2 %) elderlies. The mean age of the study population was  $67.6 \pm 6.8$  years (all above 60-90 years old, median = 65, interquartile R (IQR) = 8). The majority of the elderlies were married (72.8 %); 188 subjects (28.5 %) were illiterate; 199 contributors were housewives; 132 (29.8%) were economically dependent to others; 310 (77.5 %) could walk without any assistive device; 337 (84.2%) lived in houses; 300 (75%) had chronic diseases (Table 1).

**Table 1.** The Relationship and Mean of Facility Barrier Factors Score and Other Variables Related to the Physical Activity of Elderlies in Kashan in 2014 <sup>a</sup>

Category	Fi, %	Mean	t	df	P Value
<b>Gender</b>			3.819	398	0.000
Male	163 (40.8)	98.39 $\pm$ 20.61			
Female	237 (59.2)	106.45 $\pm$ 20.82			
<b>Marital status</b>			6.089	151.449	0.000
Married	291 (72.8)	107.47 $\pm$ 17.75			
Single	109 (27.2)	91.68 $\pm$ 24.77			
<b>Education level</b>			F = 8.474	2	0.000
Illiterate	188 (47)	105.36 $\pm$ 20.20			
Primary school	149 (37.2)	98.04 $\pm$ 22.26			
High school and above	63 (15.8)	111.05 $\pm$ 19.95			
<b>Working status</b>			-2.184	398	0.030
Working	146 (36.5)	104.91 $\pm$ 20.42			
Not working	254 (63.5)	100.14 $\pm$ 21.93			
<b>Independence status</b>			F = 21.877	2	0.000
Independent	310 (77.5)	105.73 $\pm$ 20.72			
Using mobility assistive devices	59 (14.8)	101.44 $\pm$ 18.88			
Disable	31 (7.8)	80.87 $\pm$ 14.69			
<b>Residency</b>			-2.067	73.483	0.042
Apartment	63 (15.8)	96.76 $\pm$ 27.97			
House	337 (84.2)	104.36 $\pm$ 19.35			
<b>Chronic diseases</b>			-1.471	146.075	0.143
Yes	300 (75)	104.15 $\pm$ 19.88			
No	100 (25)	100.21 $\pm$ 24.21			
<b>BMI, Kg/m<sup>2</sup></b>			F = 0.377	4	0.82
<18.5	1 (0.2)	17.56 $\pm$ 00			
18.5 - 24.9	105 (26.2)	23.46 $\pm$ 1.17			
25 - 29.9	216 (54)	27.01 $\pm$ 1.32			
30 - 34.9	75 (18.8)	31.77 $\pm$ 1.18			
35 - 39.9	3 (0.8)	35.68 $\pm$ 0.02			

<sup>a</sup> Abbreviations: BMI, body mass index; Fi, frequency; t, t- value; df, Degrees of freedom.

The mean facility/barrier factors score in physical activity of the elderly of Kashan was  $103.17 \pm 21.08$ . The facility score was  $70.82 \pm 18.27$  and the barrier score was  $32.34 \pm 6.53$ . The factors score of females ( $106.45 \pm 20.82$ ) was more than males ( $98.39 \pm 20.61$ ). Married elderlies ( $107.47 \pm 17.75$ ) had higher scores than the single ones ( $91.68 \pm 24.77$ ). The factors score were more in elderly who lived in houses ( $104.36 \pm 19.35$ ). In addition, elderlies with underlying chronic disease ( $104.15 \pm 19.88$ ) had higher scores than the others ( $100.21 \pm 24.21$ ). Individuals with higher education levels ( $111.05 \pm 19.95$ ) gained higher scores compare to the illiterate people ( $105.36 \pm 20.20$ ). The employed individuals had lower scores than the unemployed ones. The facility barrier factors score was higher in independent elderlies ( $105.73 \pm 20.72$ ) compare to others ( $80.87 \pm 14.69$ ) (Table 1).

According to Table 2, the most important facilitating

factors of physical activity of elderlies of Kashan were related to cardiovascular systems health [88 subjects (22%)]. Decreasing the laziness in 59 subjects (14.8%) and independence were the next most facilitating factors related to physical activity, mention by 57 (14.2%) subjects.

According to Table 3, the most important barrier factors in physical activity of elderlies in Kashan were related to lack of a suitable spot. The 113 participants (28.2%) completely agreed with this item.

The tests showed significant relationships among facility, barrier factors score of physical activity, physical activity level (Chi-squared = 19.91,  $P = 0.0001$ ), age ( $P = 0.001$   $r = 0.01$ ), gender ( $P = 0.000$ ), marital status ( $P = 0.000$ ), education level ( $P = 0.000$ ), personal independence ( $P < 0.000$ ), Current occupation ( $P = 0.03$ ) and living area ( $P = 0.042$ ) (Table 1).

**Table 2.** The Frequencies and Percentages of Facilitating Factors of Physical Activity in Elderly of Kashan in 2014<sup>a</sup>

	Completely Agree	Agree	Completely Disagree	Disagree
Enjoying physical activity	49 (12.2)	182 (45.5)	80 (20)	89 (22.2)
Reduction of anxiety and stress	39 (9.8)	244 (61)	276.8	90 (22.5)
Better mental health	37 (9.2)	250 (62.5)	32 (8)	81 (20.2)
Equipment supplementation	45 (11.2)	210 (52.5)	22 (5.5)	123 (30.8)
The availability of appropriate facilities	34 (8.5)	162 (40.5)	100 (25)	104 (26)
Meeting with friends	30 (7.5)	191 (47.8)	80 (20)	99 (24.8)
Preventing hypertension	46 (11.5)	190 (47.5)	48 (12)	116 (29)
Fitness maintenance	21 (5.2)	191 (47.8)	86 (21.5)	102 (25.5)
Improvement of the cardiovascular system function	88 (22)	245 (61.2)	23 (5.8)	44 (11)
Increase of body strength	35 (8.8)	166 (41.5)	126 (31.5)	72 (18)
Improvement of physical problems	29 (7.2)	173 (43.2)	109 (27.2)	89 (22.2)
Being aware of sports facilities around	16 (4)	178 (44.5)	59 (14.8)	147 (36.8)
Longevity	51 (12.8)	256 (64)	4 (1)	89 (22.2)
Reduction of fatigue	30 (7.5)	139 (34.8)	102 (25.5)	129 (32.2)
Meeting new people	32 (8)	142 (35.5)	91 (22.8)	135 (33.8)
Security in the neighborhood	32 (8)	188 (47)	88 (22)	92 (23)
Support from government agencies	26 (6.5)	219 (54.8)	42 (10.5)	113 (28.2)
Fun activities	39 (9.8)	202 (50.5)	25 (6.2)	134 (33.5)
Improvement of the quality of job	28 (7)	206 (51.5)	33 (8.2)	133 (33.2)
Being interested in the activities	37 (9.2)	188 (47)	73 (18.2)	102 (25.5)
increase of acceptance by the others	39 (9.8)	187 (46.8)	54 (13.5)	120 (30)
independence and reduced dependence	57 (14.2)	236 (59)	35 (8.8)	72 (18)
decrease of laziness	59 (14.8)	218 (54.5)	35 (8.8)	88 (22)
Higher self-esteem	32 (8)	248 (62)	50 (12.5)	70 (17.5)

<sup>a</sup> Data are presented as No. (%).

**Table 3.** The Frequencies and Percentages of Barrier Factors of Physical Activity of Elderlies in Kashan in 2014 <sup>a</sup>

	Completely Agree	Agree	Completely Disagree	Disagree
Lack of adequate time	74 (18.5)	150 (37.5)	75 (18.8)	101 (25.2)
Increasing age	85 (21.2)	161 (40.2)	49 (12.2)	105 (26.2)
Increasing weight	73 (18.2)	199 (49.8)	51 (12.8)	77 (19.2)
Embarrassment from doing the activity	15 (3.8)	129 (32.2)	92 (23)	164 (41)
Financial problems	8 (2)	116 (29)	136 (34)	140 (35)
Lack of exercise programs	24 (6)	118 (29.5)	112 (28)	146 (36.5)
Inappropriate weather	37 (9.2)	223 (55.8)	31 (7.8)	109 (27.2)
Lack of encouragement	25 (6.2)	150 (37.5)	87 (21.8)	138 (34.5)
Less presence in the family	8 (2)	153 (38.2)	106 (26.5)	133 (33.2)
Useless activities	30 (7.5)	114 (28.5)	122 (30.5)	134 (33.5)
Fear of physical injury and fall	19 (4.8)	170 (42.5)	75 (18.8)	136 (34)
Problems in social responsibilities	23 (5.8)	96 (24)	143 (35.8)	138 (34.5)
Lack of motivation	34 (8.5)	158 (39.5)	91 (22.8)	117 (29.2)
No suitable spot	113 (28.2)	185 (46.2)	48 (12)	54 (13.5)

<sup>a</sup> Data are presented as No. (%).

## 5. Discussion

The result(s) indicated that the most important facilitating/barrier factors in physical activity of elderlies in Kashan were better function of the cardiovascular system and lack suitable spot, respectively. The result of a study in Tehran, Iran reported that the most important facilitating/barrier factors in physical activity of elderlies were laziness, meeting many friends and new people and entertainment. Similarly, Resnick et al. in a study introduced factors such as health, hypertension, stress decrease and fitness (31). The limitation of time was an effective factor in physical activity of elderly in Crombie et al. study (32). Finding of the present study showed that enjoying the physical activity, available equipment, longer lifetime, fatigue, lack of adequate time and increased age were other facilitating/barrier factors in physical activity of elderly in Kashan. The consideration of these factors indicated that the facilitating factors were more relate to health promotion. Elderlies care about improved physical health. The security of the environment was also important. A suitable activity spot is essential for an aging group. Unfortunately, these issues were not considered in the past for building the patterns. The environment of physical activity must be secure for elderlies. Low safety may result in different problem in physical activity. Elderlies like to exercise in safe environments.

There was a significant correlation between the facilitating/barrier factors score of physical activity and gender. Males had lower facility scores. According to Trost et al. gender was one of the important influencing demographic variables in physical activity behavior (11). Many other studies also found similar results (27, 32, 33); although, Santos et al. reported that females obtained

higher score than men (34). Females' activity facility score in the current study may reflect the reality that females were more engaged in household activities. These activities are considered mostly as low-level physical activities and are not sufficient for adequate energy expenditure in elderlies. Male elderlies had more challenges in being physically active.

The results indicated a significant relationship between facility/barrier score and marital status. Married elderlies had higher facility scores than singles. Nevertheless, the barrier score was higher in single elderlies. However, Hekmatpour et al. in Arak reported no significant relationship between facility/barrier score and marital status (33). Burton et al. in Australia showed that seniors living with their wives and children had lower physical activity level. Marriage was a barrier factor for active elderlies (35). Henderson et al. redacted that support of family members, spouses and other individuals related to the positive encouragement affects the participation in physical activities and health programs, leading to enhanced movement. Married individuals may have broader relationships compared to single people, which could increase their activities (36).

Education status was another variable which had a significant relationship with the facility/barrier score. Individuals with higher education had higher facility scores compare to illiterate persons. On the other hand, illiterate seniors had higher barrier factors score compare to higher educated persons. Pomerleau et al. reported the same results (37). Florindo et al. in Brazil indicated that persons with higher education levels had lower barrier factors for physical activity (38). However, the types of ac-

tivities among different educated individuals were different. The level of education can influence the knowledge about physical activities and the personal hobbies. In addition, activities related to leisure and household activities do not require education (33).

The living area had a relationship with the facility/barrier score. Individuals living in houses had higher facility/barrier scores compared to the ones living in apartments. The living area has not been highly considered in other studies (27, 35, 39). The influence of the living pattern in apartments and houses on physical activity facilitating/barrier factors in elderlies needs more research.

### 5.1. Limitations and Strengths

The tool used in this study had some limitations. It had many items and relied on the memory of the elderly, which can increase the risk of under- or over-estimation of physical activities. We tried to overcome this problem by interviewing the patients. There were some items in the questionnaire that elderlies do not engage so often. This may cause the floor effect of the questionnaire. As seen, most of the subjects reported the lowest physical activity and even lack of physical activity. This study also had some strength. First, this was one of the limited studies available about the physical activity in a community-based population of the elderlies. Second, it gave a concrete and helpful data about the type of activities that elderlies usually engage. This study can provide necessary information for future planning of physical activity improvements in elderlies.

The result of the study indicated that most of the facilitating/barrier factors in physical activity of elderlies in Kashan were relate to the promotion of the cardiovascular systems health and lack of suitable spot. Being female and unmarried, chronic underlying diseases, lack of job and education, physical dependence, and high body mass index were the influential variations in facilitating/barrier factors in physical activity of elderlies in Kashan. The participants of the study were a sample of the elderlies of Kashan; so, program designing is essential according to these characters. In addition, the pattern of physical activity in elderlies depends on their life style. The promotion of active life should be a part of health care planning in elderlies.

### Acknowledgements

This paper was derived from a M.Sc. thesis in Kashan university of medical sciences. The authors wish to thank the elderlies who participated in the study.

### Authors' Contributions

Ali Sadrollahi and Zahra Khalili performed the data collection, literature review, and prepared the first draft of the manuscript. Masoumeh Hosseinian supervised the study, made critical revisions to the paper and prepared

the last revision of the manuscript. Negin Masoudi Alavi supervised the study and performed the data analysis. Zahra Khalili helped in the process of sampling.

### Financial Disclosure

Financial costs by the Masoumeh Hosseinian in the research project was received from of research council of Kashan university of medical sciences.

### Funding/Support

This study was funded by the deputy of research, Kashan university of medical sciences, Grant No. 9305.

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