

# Investigating the prevalence and causes of events leading to falls among the elderly hospitalized in Bandar Abbas hospitals

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## ABSTRACT

**Background and Purpose of Study:** Statistical indices show a growing increase in the elderly population around the world and our country. On the one hand, senior citizens are more exposed to tragic events than other age groups due to natural physiological changes. Falling down, accidents and scalds are among the most prevalent deadly events in this age group. Environmental security is vital in maintaining the elderly's health. Therefore, the present research was conducted seeking to determine the prevalence and causes of falls among the elderly hospitalized in Bandar Abbas hospitals. **Methods and Materials:** The present research is of a descriptive, cross-sectional type. Research population is comprised of all the elderly patients in Bandar Abbas hospitals. The sample included 300 individuals who were selected according to convenience sampling method till the sample was saturated. The instrument used was a questionnaire and the data were also gathered through interviews. The collected data were later analyzed by SPSS version 16. To analyze the data, descriptive statistics (frequency and percentage) were used along with the Chi-squared test. The significance level was set at  $P < 0.05$ . **Results:** From among the 300 subjects, 47.3% had experienced falls since the age of 60. In 22 of cases, it had led to injury and they were obliged to visit a doctor. The results of this research revealed that the causes of falls among the elderly were respectively: 43.33% of unbalance, 12.3% of poor eyesight, 11.66% of non-existing handles or fences, 12% of slippery ground, 2.66% of insufficient lightning, 8.66% of unbalance and poor eyesight and 9.33% of other reasons. As the results revealed, a correlation existed between falls and educational level ( $P < 0.025$ ). Moreover, a significant correlation was found between sex and falls ( $P < 0.011$ ). A similar significant correlation was also observed between the place of residence and falling down ( $P < 0.045$ ). **Conclusion:** According to the research results, planning to prevent events and traumas among the elderly and securing their residential environment is of an essential significance.

**Key words:** Bandar Abbas, elderly, events, prevalence

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## INTRODUCTION

A large proportion of world population is rapidly growing old. Every year, 1.7% is added to world population. However, such an increase in the elderly population who are at or above 65 is 2.5%.<sup>[1,2]</sup> Statistical indices are also indicative of population aging in Iran.<sup>[3]</sup> Events are, today, of a considerable significance among the elderly. That is because, first of all, the world elderly population is on the rise. Secondly, the active lifestyles of senior citizens and their participation in physical activities more fitted to the young expose them to the risk of serious injuries. Eventually, the consequences of

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such injuries are much greater in them than the young. As compared to youngsters, the rate of their hospitalization, the length of their stay and medical costs are higher. The rate of mortality and long-term consequences are higher as well.<sup>[4]</sup> Generally speaking, age is a key factor in predicting mortality in traumatic patients. Concomitant changes with aging such as the reduction of physiological potential, inadequate metabolic and gland responses which are considered as part of the natural aging process alter the diseases accompanying the use of drugs and the consequences of trauma.<sup>[5,6]</sup> Many researchers are concerned about the fact that the elderly population growth might increase medical costs and lead to fiscal and economic crises.<sup>[7,8]</sup> It has been recently announced by the U.S. society of ethology that falling down is the most important factor leading to mortality and disability among the elderly population. It has imposed over 20 million dollars of annual cost on the healthcare and medical system.<sup>[9]</sup> Being old is not in itself a kind of disease. However, due to the known physiological changes, the number of acute and chronic diseases and the need for medical healthcare is increased among the aged.<sup>[10,11]</sup> Due to natural changes brought about by the aging process including changes in senses, slowing down of reactions, reduction of sensitivity to pain and heat, changes in walking and keeping one's balance along with the efficacy of drugs this age group is more prone to events than others. Collapse, car accidents and scalds are among the most prevalent causes of mortality among the elderly. The majority of events happen to the aged in or outside their home.<sup>[12]</sup> A myriad of research revealed that 30-40% of the elderly who live on their own experience falls inside their house every year. In 2003, over 1.8 million adults above 65 years of age were hospitalized in emergency wards and over 42,100 were hospitalized in wards. In 2004, nearly 15,000 individuals above 65 lost their lives due to injuries induced by falls. 85% of mortalities occurred among those above 75.<sup>[13]</sup> Generally speaking, falls are the sixth most important reason for mortality among the aged; it comprises two third of all events happening to this age group.<sup>[14]</sup> Security is a general term referring to protection against and prevention of events and injuries. Environmental security is essential for the health of the elderly. It has been estimated that about 30% of falls can be prevented through multiple interventions. Provision of instructions for patients is the first step in prevention and management of falls.<sup>[15]</sup> A myriad of research has been conducted abroad concerning the prevalence and underlying factors of falling down among senior citizens dwelling in the society or institutes. Most of them have reported the following factors as correlates of this issue: Background diseases including heart disease, diabetes, poor eyesight, high blood pressure; common skeletal-muscular diseases, rheumatism, knee and thigh joint arthritis; and as concerns the nervous system, vertigo and brain stroke.<sup>[16-18]</sup> In Iran. However, little research has been conducted with this regard. The findings obtained by Akbari about the elderly residents of nursing homes revealed that falls primarily happen outside one's room and when they are most active, that is in the morning.<sup>[19]</sup> In another research, Salarvand investigated the prevalence of falls related to chronic diseases among 400 seniors above 60 in

Khoramabad. The results indicated that 24.8% of this sample had experienced falling down within a year's time. They also indicated that affliction with chronic diseases increased the risk of falls in the elderly significantly.<sup>[20]</sup> Safizadeh *et al.* found out that from among 11,120 individuals above 60 in Kerman, the most frequent event type belonged firstly to traffic events and secondly to blows and falls.<sup>[21]</sup> In another study carried out by Raoufi in 2006 titled as "investigating the reasons for the elderly falls in Aligoudarz county of Iran." It was revealed that 55.5% of women and 35% of men had experienced 1 to 3 falls during the past year. The most common places for the falls were: Stairs 30%, kitchen 27%, rooms 18%, bathroom 13%, yard and the gate way 27% and alleys and streets 15%. In addition, 16% had an experience of car accidents among which 51% led to superficial consequences, 24% had caused severe injuries and 13% resulted in fractures.<sup>[22]</sup> Senior citizens comprise a vulnerable group in society. One of the primary goals of their healthcare is to help them to maintain autonomy in a secure environment so that they are prevented from falling and their quality of life is improved. Little research has been conducted about the elderly in Iran. Due to the existing differences concerning health state, social and economic conditions of the elderly in different countries, the results of studies conducted abroad are not generalizable to the Iranian senior population. On the other hand, a precise knowledge of the epidemiology of falls and discovering the factors involved can help healthcare providers to appropriately intervene in order to control such factors and prevent these fall and their consequences. Therefore, we decided to conduct a research to investigate the prevalence and causes of falls among the elderly population hospitalized in Bandar Abbas hospitals.

## MATERIALS AND METHODS

The present research is of a descriptive, cross-sectional type. All the elderly hospitalized in Bandar Abbas hospitals comprised the research population. Sample size was determined through the following formula, while the degree of confidence was 95% and precision was 0.08%. Inclusion criteria were: Iranian nationality, 60 years of age or above, hospitalization in Bandar Abbas hospital, ability of and interest in responding to questions and participating in the research. Exclusion criteria were: Affliction with dementia, reluctance to participate in research. The data gathering instrument used in this study was the questionnaire developed by the researcher himself. It was developed through the perusal of previous research as well as other validated questionnaires used in other studies. This 25-item questionnaire was comprised of two main sections, one being the demographic information [8 items] such as age, sex, residential area, education level, marital status, the reason for hospitalization and the second section comprised of 17 items. This section concerned one's history of falling down from the age of 60 above, history of falling within a year prior to the study, type and the severity of injury, location of falls, reason for falling and regular physical activity [at least 30 minutes of walking, three times a week]. Content and face validity were confirmed by 10 professors. Moreover, in this research in order to confirm the national trust of the

questionnaire, a pilot study was first conducted in the hospital and the defects were identified in a scientific environment and were then corrected by technical experts. Subsequently, a test–retest reliability method was used. The researcher submitted the questionnaire two times with a 2-week interval to the same elderly subjects and the results were compared together. Then, the test reliability was estimated by the Cronbach alpha test and was found to be 0.68. Having obtained the required permissions in consecutive days, the researcher referred to all wards of Bandar Abbas hospitals and began sampling based on convenient sample selection method till the sample was saturated. Questionnaires were filled out after the required permissions were given; the researcher was introduced to target subjects; the purpose of study was elaborated on and the subjects were ensured of the confidentiality of data and consented to take part in the research and the interview. The collected data were analyzed using SPSS version 16. Descriptive statistics including total frequency, relative frequency, mean, standard deviation and also Chi-squared test were used to analyze the data. The significance level was set at  $P < 0.05$ .

## RESULTS

From among the 300 subjects, 54% were males and 46% were females. 69% were urban residents and 30.7% resided in rural areas. 69.7% were married and 1% were divorcees. Concerning educational level, 70% of the subjects were uneducated and 3% had a degree higher than diploma. Uneducated men comprised 59.3% of the subjects while uneducated women comprised 82.3% of them. The most common reason for hospitalization among the participants was related to cardio-vascular diseases (23.3%). The majority of subjects (76.3%) were afflicted with more than one chronic disease and 17% suffered from one chronic disease.

The results of the present research indicated that from among the 300 elderly subjects, 47.3% had experienced falls since they were 60 years old until the conduction of this research. In 22% of cases it had led to injuries and visits to a doctor. The most frequent red spots were staircase 24%, yard and the alley 20.5%, street 19%, kitchen 19%, bathroom 10% and room 7.5%. On the whole, 60.5% of the falls had happened inside home and 39.5% in alleys and streets.

The reasons for the falls among the elderly who participated in this study were unbalance 43.33%, poor eyesight 12.3%, absence of handles and fences 11.66%, slippery ground 12%, insufficient light 2.66%, unbalance and poor eyesight 8.66% and other reasons 9.33% [Table 1].

According to the findings of this research, a significant correlation was found between the falls and education level ( $P < 0.025$ ). Low educated or uneducated subjects were more prone to the hazards of falling down. A similar correlation was also found between sex and falls ( $P < 0.011$ ). Women were more prone to the events induced by falling down than men; however, this correlation was not significant.

**Table 1: Frequency distribution of target subjects in terms of the reasons for falls**

Sex Variables	Male		Female		Total	
	F	%	F	%	F	%
Unbalance	60	44/11	70	41/91	130	43/33
Poor eyesight	18	13/53	19	11/37	37	12/3
No handle or fence	11	8/2	24	14/37	35	11/66
Slippery ground	16	12/03	20	36	336	12
Insufficient light	2	1/5	6	3/59	8	2/66
Unbalance and poor eyesight	14	10/52	12	7/18	26	8/66
Other reasons*	12	9/02	16	9/58	28	9/33
Total	133	100	167	100	300	100

\*Include the choice of more than one option from the above. F=Frequency

Another significant correlation was observed between one’s place of residence and falls ( $P < 0.045$ ).

## DISCUSSION

The results of the present study revealed that from among 300 participants, 47.3% had experienced falls from the age of 60 until the time of research. In 22% of cases those falls had led to injuries and visits to a doctor. A study conducted in Khoramabad indicated that 20.8-28.8% of senior citizens had experienced falling down within the year prior to the study. The findings obtained by Salarvand *et al.* indicated that over one third of individuals at or above 65 experience falls every year.<sup>[20]</sup> This divergence can be due to the different and more active life style of the elderly in other societies.

The research conducted by Bleijlevens *et al.* indicated that approximately from among every three elderly at or above 65, one person experiences at least one fall a year. In half of the cases, this leads to physical injury and in 5% of the cases it leads to fractures. In 5% to 10%, it results in severe injury to soft tissues.<sup>[23]</sup> In another research with this concern which was carried out in the USA, the age group most prone to such events was reported to be the elderly above 65. Their trauma, in the majority of cases, was falling down from heights. Approximately from among every three American seniors, every year one person experiences falling down from heights within a year’s time.<sup>[24]</sup> The results of the present research indicated that the events happening at home comprised the majority of cases. Nader’s study titled as “events and accidents targeting the elderly visiting Shiraz hospitals” revealed that from among the 207 elderly patients hospitalized for trauma, 61% were males and 39% were females. The best target of such traumas was the age group 65 to 69. One’s home was found to be the most common place for such events to occur.<sup>[25]</sup>

The results obtained by Varas *et al.*, who aimed to investigate the prevalence, features and consequences of falls among 362 Spanish elderly patients at or above 70, indicated that the prevalence of falls among them was 31.78%. 12.98% of the subjects had experienced more than one fall during the previous year. 55.3% of the falls had occurred inside one’s home and in 35% of cases it had led them to visit medical healthcare

centers. 3.3% of the cases required hospitalization.<sup>[26]</sup> In Mancini *et al.*'s study on 2273 Italian individuals at or above 65, the prevalence of falls was reported to be 28.6% in a year's time. More than half of the subjects had two or more falls and the place with the highest frequency of falls was reported to be one's home.<sup>[27]</sup> In Raoufi's study as well, the place with the highest probability of falling down was found to be one's home.<sup>[22]</sup> In Emirates, one's house was also reported as the red spot for the majority of falls. Similar results were also obtained in the USA.<sup>[28]</sup> The results of the present research were in line with the above-mentioned literature.

The findings obtained by Safizadeh *et al.* indicated that from among the 11,120 elderly participants who were at or above 60 in Kerman, the most common type of event belonged to traffics. Blows stood next and falls were the third common event type.<sup>[21]</sup> In a study conducted in Turkey, the most frequent events were of the traffic type.<sup>[29]</sup> The results obtained in the present research were dissimilar to the study just mentioned. It appears that one reason for the falls of the senior citizens of Bandar Abbas might be the urban design of this city. Moreover, the climate of this city requires the elderly to spend more time at home than outside.

All the body of research mentioned above indicates that about one third of the elderly studied during the past year had experienced falls. However, in our research about half of the subjects had experienced falls. And this divergence could be due to the differences in health state, social and economic conditions of the other studies and ours. In fact, considering the sameness of the conditions of the elderly themselves, this divergence could be dependent on the cultural and social conditions of Iran (as a developing country) as compared to developed countries. That is because in our country the way has not been paved for preventing physical injuries happening to the elderly. Moreover, no instructions, acculturation or environmental changes are offered to this age group. To the contrary, in developed countries, the required acculturation has occurred and the stage has been set with this regard. The society and environment are made appropriate for seniors and have been adapted to their needs. This could be the big difference. In the above-mentioned studies, one's history with falls was investigated during one year prior to the study. In the present research, however, the same issue was investigated since the age of 65 till the time of study. Comparing the prevalence of falls in this study and the other studies might seem more logical.

As the findings revealed, experiencing falls was more prevalent among women than men. This was in a similar vein with the findings of Bekibele *et al.*, on Nigerian subjects above 65<sup>[30]</sup> and Salarvad and Birjandi<sup>[20]</sup> whose work was titled as "Determining the correlates of falls among the elderly population." They also found a higher prevalence of falls among women than men. The reason why women experience falls more than men in this research and the others might lie in the skeletal-muscular structure of men's body. They have stronger and thicker muscles than women. Moreover, the difference in hormones can also lead to the

difference in the structure of muscular mass and less strength among women.<sup>[30]</sup> Another reason for the lower prevalence of falls among men can be the more regular physical activities of elderly men than women.

According to the obtained results, the frequency of events in men at or above 65 is higher than women. The results obtained by Safizadeh *et al.* indicated that from among 1120 individuals at or above 60 in Kerman, 63% were males and 37% were females. This is similar to the finding of our research.<sup>[21]</sup>

The findings of the present study showed that collapse and falling down is the most important cause of the events happening to the elderly population. The results obtained by Varas *et al.* indicated that the age group most prone to events and accidents was above 65 years of age and their trauma was in the majority of cases caused by falling from heights.<sup>[26]</sup> In the body of research conducted by Nader and Rakei in Shiraz in Iran,<sup>[25]</sup> Richmoud *et al.* in the USA,<sup>[31]</sup> Ahmad *et al.* in Emirates<sup>[32]</sup> and Gowing and Jain in Canada<sup>[33]</sup> the highest frequency was found to belong to falls. The results of the present research were similar to those mentioned above.

In the present research, the most important causes of the elderly falling were unbalance and poor eyesight. The study conducted by Raoufi showed that the key risk factors of falls among the elderly were eyesight problems and physical weakness.<sup>[22]</sup> From Tremblay and Barber's perspective, osteoporosis, poor eyesight and inadequate physical activity were among the reasons for falls.<sup>[34]</sup> Moreover, Tinetti *et al.* made mention of consuming particular drugs, unbalance and walking problems as the causes of falls among the elderly.<sup>[35]</sup> The finding of these studies were in line with those of the present research.

Generally speaking the risk factors involved in the elderly falls can be divided into two groups: Personal factors (diseases, drugs, life style, sex, age, etc.) and environmental factors (slippery ground, inadequate coverage, absence of handles or protective fences, inadequate light, unsuitable shoes, etc.). The results of the present research showed that unbalance and poor eyesight are among the most crucial reasons for the elderly falls. The results of other studies with this concern also revealed that unbalance has been a key factor leading to falls among the aged<sup>[22]</sup> which was similar to the findings of our research.

## CONCLUSION

The findings of the present research indicated that one out of every three senior citizens of Bandar Abbas had experienced falling down within a year's time. Furthermore, the reasons for their falls were unbalance, poor eyesight, absence of handles or protective fence, slippery ground and inadequate light. In the analysis of the factors leading to falls and preventing the elderly events, the society needs the cooperation of a protective system. Such a system can help to reduce the hazards of falls among the elderly through: Adapting the environment to the

physical and mental state of the elderly, using appropriate aiding tools, identifying the elderly at risk and instructing them and their families on preventive strategies.

### LIMITATIONS

Among the limitations of this research, mention can be made of the small sample size due to lack of access to the elderly and reluctance of some of them to participate. The results obtained are, therefore, not generalizable to the elderly population of Hormozgan province. Answering in a way so as to seem acceptable and desirable either to the society or the researcher is among other factors which set limits on the results of this research.

### SUGGESTION

Considering the physical state of the elderly, their vulnerability to events, their intolerance of trauma and higher mortality rate among them, this age group needs to be made aware of the consequences of falls and make attempts to prevent such events. The severity of osteoporosis must be examined and treated in all the elderly prone to collapse. Moreover, considering the role of families in supporting the elderly members at home and also the role of nurses in nursing homes, they are expected to cooperate as far as they can with this age group. Their multi-dimensional interventions can target strength, balance, instructions on how to take one's steps, improvement in movements with or without aiding tools, investigation of their untreated medical problems and eye healthcare. They can also provide instructions on how to prevent the falls, investigate and control the hazards at home or nursing home and can, therefore, help this vulnerable age group more than ever before.

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