

## FEAR OF FALLING

## AUTHORS

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## SUMMARY

Fear of falling (FOF) is a significant health problem that can be present in the elderly, both in those that had experienced falling and in those that hadn't. The aim of the study was to establish correlation of FOF with the following characteristics of the participants: sex, age, education, marital status and the number of falls in the previous year. Performed from October to December 2014, the research included 100 participants from general population older than 65 and covered by health visiting service of Dom Zdravlja Nis. The questionnaire for assessment of FOF - Falls Efficacy Scale (FES) and the epidemiological questionnaire were used in all participants. We established that there is statistically significant difference of FES values (hi-kvadrat=7.668,  $p < 0.05$ ) between different age groups. It was found that median value of FES questionnaire is statistically significantly higher in participants living as singles in relation to those living in a community ( $U=828.0$ ,  $p < 0.05$ ). There is statistically significant medium correlation between FES values and the number of falls in the previous year ( $r=0.661$ ,  $p < 0.01$ ). This research established that FOF is associated with age and the number of falls in the previous year, that implies the need for prevention of FOF, especially in elder people and in people that experienced one or more falls. Implementation of prevention is also important in people living alone because FOF is excessive in their case.

**Key words:** FES, fear of falling, falling, the elderly

## INTRODUCTION

Aging and age is a significant problem nowadays, the problem that has been paid a lot of attention to. Aging is a continuous process and it is followed by a progressive decrease of physiological capacity. In the aging process, falls influence the elderly tremendously [1]. Falling in elder people is defined as "an event which results in a person coming to rest unintentionally on the ground or lower level, not as a result of a major intrinsic event (such as stroke or epileptic seizure), or overwhelming hazard" [2]. Falls in the elderly are the result of weaker function of more organic systems. Falls represent a serious problem in geriatric population because of their high frequency [1]. One third of general population experience a fall yearly, having numerous health and social problems as consequence [3]. The frequency of falls increases with age because elderly people have decreased ability to react as quickly and effectively as the younger ones [4]. Frail and elderly have greater risk of fall caused not only by medical but also by psychosocial factors [5]. Falls and injuries resulting from falls are frequent and risk factors for falls are multiple, making the diagnosis, treatment and prevention difficult [6]. One fourth of the elderly has serious injuries after a fall [1]. Falls result in decrease of physical activity, increase of morbidity and mortality as in frequent institutionalizing [4]. Falls cause the decrease of functional ability in almost 33% of the elderly [4]. In elderly, falling leads not only to serious physical consequences but also to various

psychic disorders [7]. Anxious syndrome and remarkable fear of falling often occur. It can be said that in geriatrics the fear of falling represents lack of self-confidence while performing everyday activities [8, 9], resulting in decreased activities and caution while walking in order to prevent falling [10, 11]. Some authors use the term fear of falling to mark the excessive falling related concern leading to the decrease of functional abilities [12]. This fear was first described in 1982 by Murphy and Isaacs who realized that people develop excessive fear followed by walking disorder. Fear of falling can be present in elderly people from general population that either have had a fall or haven't had a fall [13].

If not outsized, fear of falling itself is not a problem [14]. However, when fear of falling causes decreased activities and functional abilities, then it can become a risk factor for falling [14, 15]. There is a synergistic interaction between falling and fear of falling [16]. Fear of falling and falling are related in two directions: people that have already experienced falling have greater fear of falling, and also, fear of falling can be a risk factor [7, 17]. Factors such as decrease of physical and functional ability and low quality of life that influence the occurrence of fear of falling can be both the cause and the consequence of fear of falling [18]. Fear of falling, as a psychological consequence of falling, is also called a "post-falling syndrome" [13]. Fear of falling have a multifactorial etiology and can be a greater and more frequent problem than the falling itself in the members of the geriatric population [18].

Falling and particularly fear of falling limit the elder people to a great extent in applying physical activities with the aim to improve their own health [3]. Better understanding and assessment of fear of falling in the elderly is significant in order to conduct primary and secondary prevention of falling in the population with increased fear of falling [13] and it can contribute to independent functioning of elder people [19, 20].

## THE AIM

The aim of this research is to establish the correlation of fear of falling in participants elder than 65 with some of their characteristics: sex, age, education, marital status and the number of falls in the previous year.

## MATERIAL AND METHODS

This research was a cross-sectional study performed in the period from October to December 2014, including 100 participants from general population older than 65 who are included in the work of community nurses of Dom Zdravlja Nis. Using the epidemiological questionnaire, data were obtained in all participants about sex, age, education, marital status and the number of falls in the previous year.

We used "Falls Efficacy Scale" (FES) questionnaire for assessment of fear of falling [21]. FES questionnaire assesses fear of falling on the basis of the estimation of the participant's perception of balance and stability while performing 10 activities of daily living [21]. FES questionnaire has 10 questions and is used for assessment of the degree of self-confidence for performing 10 activities of daily living. The degree of self-confidence (while performing each of the activities) is graded from 1 (very confident) to 10 (not confident at all), so that the total score ranges from 10 to 100. Higher score implies to greater degree of fear of falling, in other words, to lower degree of confidence while performing everyday activities [21]. This questionnaire showed high reliability [21, 22] and possibility to suggest falls of the future [23].

### Statistical data processing

Methods used for primary data analysis are the descriptive statistical methods, statistic hypotheses testing methods, interdependence examination methods. Central tendency measures (mean, median), variability measures (standard deviation) and relative numbers (structure indicators) were used concerning the descriptive statistical methods. A t-test for

two independent samples, Mann-Whitney test and Kruskal-Wallis test were used concerning statistic hypotheses testing methods. Spearman coefficient of rank correlation was used concerning interdependence analysis. Statistical hypothesis were tested on the level of statistical significance (alpha level) of 0.05 and 0.01. Software program IBM SPSS Statistics 22 (SPSS Inc., Chicago, IL, USA) was used for statistical processing of the results.

## RESULTS

In the mentioned sample of 100 participants the number of female participants was greater, that is to say women made about 2/3 of the participants. The struc-

ture of participants by sex is shown in Table 1. Values of FES questionnaire by sex are shown in Table 2. There wasn't statistically significant difference between male and female participants by the FES questionnaire values ( $U=970.50$ ,  $p=0.226$ ). The average age of the participants was 78.8. The age structure of the participants by sex is shown in Table 3 where we can see that the average age of the participants did not differ statistically significantly related to the participants sex ( $t=0.986$ ,  $p=0.326$ ). By analyzing fear of falling related to the age of participants, it was established that between the participants of different age groups there is statistically significant difference of FES questionnaire values ( $hi\text{-square}=7.668$ ,  $p<0.05$ ), that is shown in Table 4. Statistically significant difference was established between age groups of 65-74 and 75-84 as well as between groups of 65-74 and 85 and more years ( $p<0.05$ ), while between age groups 75-84 and 85 years and more there is no statistically significant difference ( $p=0.719$ ). It was found that median value of FES questionnaire is statistically significantly greater in participants living as singles related to those living in community ( $U=828.0$ ,  $p<0.05$ ) that is shown in Table 5.

Values of FES questionnaire by level of education shown in Table 6, show that the difference of FES questionnaire median values is statistically significant between participants with secondary education and those with high/university education ( $U=152.5$ ,  $p<0.05$ ). FES values by the number of falls in the previous year are shown in Table 7. There is statistically significant difference of FES median values ( $hi\text{-square}=46.164$ ,  $p<0.01$ ) between participants with different number of falls in the previous year. The difference of FES median values is statistically significant between participants with no falls and those that had one fall ( $p<0.01$ ), as well as between participants that had no falls and those that had two or more falls in the previous year ( $p<0.01$ ), but the difference of FES median values is not statistically significant between participants that had one fall and those that had two or more falls in the previous year ( $p=0.686$ ).

Correlation of FES values with the values of the former variables is shown in Table 8. In Graph 1, correlation between FES values and the age of participants is shown and this correlation demonstrates that there is statistically significant weak correlation ( $r=0.267$ ,  $p<0.01$ ) between FES values and age. This would mean that the higher the age, the greater the FES values are. There is statistically significant medium correlation ( $r=0.661$ ,  $p<0.01$ ) between FES values and the number of falls in the previous year, that is shown in Graph 2. That would mean that with the increase of number of falls in the previous year the values of FES are also increased.

Table 1. Sex structure of participants

Sex	N	%
Male	35	35.0
Female	65	65.0
Total	100	100.0

Table 2. FES values by sex

Sex	N	$\bar{x} \pm SD$	Median	Min	Max
Male	35	44.31±32.0	40.0	10	100
Female	65	53.71±27.7	59.0	10	100

FES- Scale for the assessment of fear of falling, scores 10-100, where higher value shows greater fear of falling

Table 3. Age of participants by sex

Sex	N	$\bar{x} \pm SD$
Male	35	79.7 ± 6.8
Female	65	78.3 ± 6.8

Table 4. FES values by age

Age	N	$\bar{x} \pm SD$	Median
65-74	27	37.6 ± 24	40.0
75-84	53	54.5 ± 29.6	70.0
85 and more	20	57.0 ± 31.8	70.0

FES- Scale for the assessment of fear of falling, scores 10-100, where higher value shows greater fear of falling

Table 5. FES values by marital status

Marital status	N	$\bar{x} \pm SD$	Median	Min	Max
Living alone-single	64	55.4 ± 25.8	64.5	10	100
Living in a community	36	41.6 ± 33.6	27.0	10	100

FES- Scale for the assessment of fear of falling, scores 10-100, where higher value shows greater fear of falling

Table 6. FES values by level of education

Level of education	N	$\bar{x} \pm SD$	Median	Min	Max
Primary	40	47.1 ± 29.5	52.50	10	100
Secondary	49	56.4 ± 28.5	57.0	10	100
Higher / University	11	36.8 ± 29.6	21.0	10	74

FES- Scale for the assessment of fear of falling, scores 10-100, where higher value shows greater fear of falling

Table 7. FES values by number of falls in the previous year

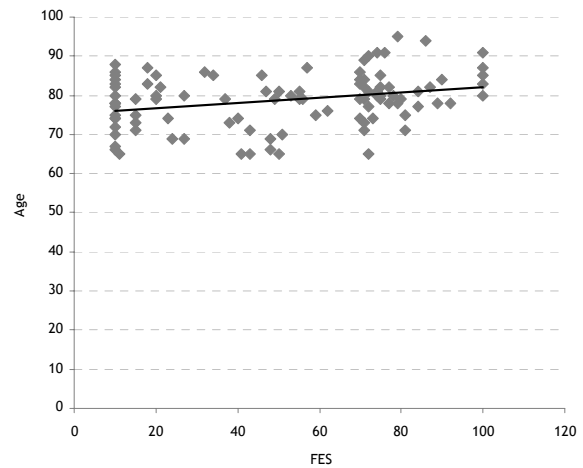
Number of falls	N	$\bar{x} \pm SD$	Median	Min	Max
None	62	35.2 ± 24.8	27.0	10	100
One	29	76.1 ± 16.5	75.0	18	100
Two and more	9	72.8 ± 18.4	74.0	34	92

FES- Scale for the assessment of fear of falling, scores 10-100, where higher value shows greater fear of falling

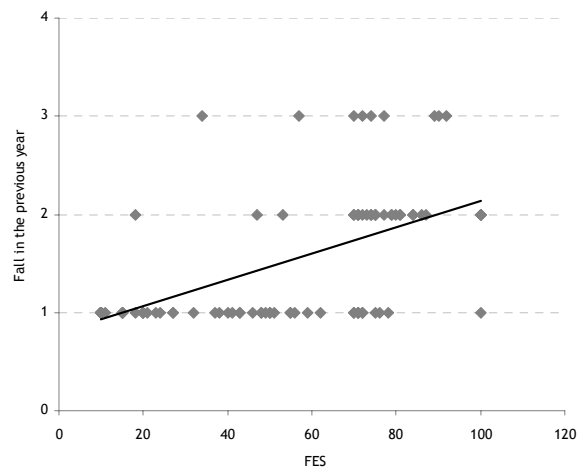
Table 8. Correlation of FES values with the values of the given variables

Parameters	N	r	P
Age	100	0.267	<0.01*
Education	100	0.011	0.915
Number of falls in the previous year	100	0.661	<0.01*

FES- Scale for the assessment of fear of falling, scores 10-100, where higher value shows greater fear of falling



Graph 1. Correlation between FES values and the age of participants



Graph 2. Correlation between FES values and the number of falls in the previous year

FES- Scale for the assessment of fear of falling, scores 10-100, where higher value shows greater fear of falling

## DISCUSSION

Investigation of correlation of fear of falling with some characteristics of the participants is important with the aim of applying primary and secondary prevention in people with increased risk of falling. The aim of this study was to establish the correlation of fear of falling with sex, age, education, marital status and number of falls in the previous year in participants elder than 65. We used two questionnaires: the epidemiological questionnaire and FES questionnaire for assessment of fear of falling to establish mutual correlation of fear of falling and the mentioned characteristics of participants.

Fear of falling can be measured by different questionnaires, but we decided on FES questionnaire [21] because it proved to be highly reliable in assessment of fear of falling. Housedorff et al. assessed the fear of falling in two ways. The first way was to ask one single question 'Do you have fear of falling?' that should be answered with 'Yes' or 'No' and the other way was the application of FES questionnaire [24]. Their conclusion is

that it is better to assess fear of falling by the questionnaire than by asking just one question, since the application of the questionnaire can offer a better insight into the prominence of fear of falling while performing activities of daily living [11, 24].

Falling, causes of falling and fear of falling are subjects of many investigations considering the aging of population and more frequent occurrence of falling and fear of falling in time. Fear of falling is a serious problem in geriatrics and it can be considered as a consequence, but also as a cause of falling, as well. It is evident in 46-56% of the elderly [24].

Our results showed that fear of falling is more excessive in persons elder than 74. The increase of the frequency of fear of falling with the aging was also found by other authors [12, 20]. Gertrudis I. et al. also concluded that persons aged 80 and more have greater fear of falling than younger persons [14]. Some authors found that fear of falling is more frequent in women than in men [13, 20], that is contrary to our results which showed that there is no statistically significant difference in the degree of fear of falling between male and female participants.

We also found that fear of falling is more excessive in participants with secondary education related to those with high/university education. E. And R. Bertera found that greater frequency of fear of falling is present in persons with lower education [20].

It was found that fear of falling is greater in participants living as singles than in those living in a community, which is in line with the other authors who also found that fear of falling is more excessive in persons living as singles [20].

In numerous studies it was found that one of the main risk factors for falling is at least one previous fall [13, 25]. Fear of falling is claimed by 29-92% of the elderly who had one or more falls [26]. Our research showed that fear of falling is greater in persons that have already had one or more falls than in persons that did not fall in the previous year, that is to say that between the degree of fear of falling and the number of falls in the previous year there is statistically significant correlation, that is in line with the results of other authors studies that found the existence of correlation of fear of falling and falling [12, 17]. However, in our research there is no statistically significant difference between the presence of fear of falling in persons that experienced one and those that experienced two or more falls in the previous year, which is contrary to the results of studies of other authors who found that previously experienced two or more

falls significantly increase the degree of fear of falling [12].

The increased fear of falling often conditions, in the elderly, greater probability of balance disorder and falling [26], that speaks on the behalf of the statement that fear of falling and falling are connected in two directions: fear of falling can be the cause, but it can also occur as a consequence of falling.

The limitation of our study is that it is a cross-sectional one. We should take into account that the research of fear of falling at a period of time can have disadvantages, considering the fact that fear of falling changes in time[12].

Fear of falling significantly influences the morbidity rate and the quality of life of the elderly, so it's significant that future studies research the fear of falling [12]. Future studies should also research the influence of fear of falling to the activities of daily living, as well as factors that influence the fear of falling.

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## CONCLUSION

Statistically significant correlation of fear of falling with age, found here, implies to the necessity of prevention of fear of falling, especially in the elderly. Applying prevention is very important in persons that experienced falling in the previous year, as well as in persons living alone, since we found statistically significant correlation of fear of falling with the number of falls in the previous year, and it was also found that fear of falling is greater in persons living alone.

Establishing fear of falling in participants elder than 65 is important because it is known that fear of falling increases the risk of falling. Researches dealing with fear of falling are important for application of procedures for its reduction that can significantly influence the increase of independence and independent functioning of elder people.

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## SRPSKI

## STRAH OD PADA

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## SAŽETAK

Strah od pada je značajan zdravstveni problem, koji može biti prisutan, kako kod onih osoba koje su već doživele pad, tako i kod onih koje nisu. Cilj rada je bio da se utvrdi korelacija straha od pada sa nekim karakteristikama ispitanika: polom, godinama starosti, obrazovanjem i bračnim statusom, kao i sa brojem padova u prethodnoj godini. Ispitivanjem je bilo obuhvaćeno 100 ispitanika, iz opšte populacije, starijih od 65 godina, obuhvaćenih radom patronažne službe Doma zdravlja Niš, u periodu od oktobra do decembra

2014. god. Kod svih ispitanika korišćen je upitnik za procenu straha od pada „Falls Efficacy Scale“ i epidemiološki upitnik. Utvrđeno je da između pacijenata različitih starosnih grupa postoji statistički značajna razlika vrednosti FES upitnika (hi-kvadrat=7.668,  $p<0.05$ ). Nađeno je da je medijana vrednosti FES upitnika statistički značajno veća kod ispitanika koji žive kao samci u odnosu na ispitanike koji žive u bračnoj zajednici ( $U=828.0$ ,  $p<0.05$ ). Između vrednosti FES upitnika i broja padova u toku predhodne godine postoji statistički značajna osrednja povezanost ( $r=0.661$ ,  $p<0.01$ ). Ovim istraživanjem smo utvrdili da je strah od pada povezan sa godinama starosti i sa brojem padova u prethodnoj godini, što ukazuje na potrebu sprovođenja prevencije straha od pada, naročito kod starih ljudi i kod ljudi koji su doživeli jedan ili više padova. Sprovođenje prevencije je važno i kod osoba koje žive same, jer je nađeno da je kod njih strah od pada izraženiji.

**Ključne reči:** FES, strah od pada, pad, stari ljudi

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