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# Prevalence of Depression and Associated Factors in Non-institutionalized Older Adults With a Previous History of Falling

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ABSTRACT

The purpose of this paper was to estimate the prevalence of depression and associated factors in people aged 65 or older with a history of falling in the last 12 months. A cross-sectional descriptive study was performed involving a random sample of 213 participants from two social centers for older adults in the city of Zaragoza (Spain). The mean age of the participants was 77.3 years (SD ± 7.0). Our findings reveal a prevalence of depression of 28.2% in the study sample, with older adults who were at a high risk of falling being more susceptible to developing depression. In conclusion, one in three elderly people who were at risk of suffering a fall in the 12 months prior to data collection had symptoms of depression. This is in agreement with the results from previous studies, which confirm that there is a high prevalence of depression in elderly patients with a previous history of falls.


## INTRODUCTION

According to the World Health Organization (WHO), 37.3 million falls that occur worldwide every year are severe enough to require medical attention (World Health Organization, 2012), and represent a loss of >19 million dollars per disability-adjusted life year. More specifically, 30% of people over 65 living in the community fall at least once a year (Petridou et al., 2008; Swift & Iliffe, 2014), and approximately half of the elderly who suffer a fall end up falling again in the following year. This has a considerable impact on this population at physical, psychological and socioeconomic levels, which in most cases leads to disability, hospitalization (Gill, Murphy, Gahbauer, & Allore, 2013; Rubenstein, 2006) and even to institutionalization (Evitt & Quigley, 2004; Stel, Smit, Pluijm, & Lips, 2004). In 2012 the World Health Organization estimated that there had been around 424,000 fatal falls worldwide, which makes falling the second leading cause of death from unintentional injuries. The highest mortality rates due to falls were in people aged 60 or over (Fig. 1).

Depression is another very frequent geriatric syndrome, and has often been associated with falls in the elderly (Iaboni & Flint, 2013). According to various studies in different countries, the prevalence of depression in non-institutionalized elderly people is between 13 and 23% (Anstey, Von Sanden, Sargent-Cox, & Luszcz, 2007; Braam et al., 2010; Hamer, Bates, & Mishra, 2011). In particular, depression is more frequent in women, in people with a medium-low socioeconomic status, and in those individuals with higher disability and comorbid conditions (German et al., 2011; Nicolosi et al., 2011).

An increased risk of both falls and depression has been associated with the elderly population (older than 65 years) (Anstey, Burns, Von Sanden, & Luszcz, 2008; Biderman, Cwikel, Fried, & Galinsky, 2002; Wada et al., 2008). Usually, neither syndrome is easily detected in primary care, which means that this population may not always receive adequate and timely treatment (Banazak, 1996). There may be three different ways in which depression and falls can be related. Firstly, depression may be a risk factor for falls; secondly, falls may be a cause leading to a depressive symptomatology in elderly individuals (Whooley et al., 1999); finally, both syndromes may be the result of a third condition or set of factors that adversely affect health in the elderly population (Biderman et al., 2002). However, the mechanism underlying this association is not yet clear as there is a significant bidirectional relationship between depression and falls. Approximately, 25–55% of non-institutionalized people over 65 are able to identify the causes of falling or fall risks (Tinetti, Mendes de Leon, Doucette, & Baker, 1994). This may sound like a positive but it is possible that, in some cases, the fear of suffering recurrent falls may become excessive and disabling, to the point of experiencing agoraphobia, thus increasing the risk of future falls. Additionally, it is

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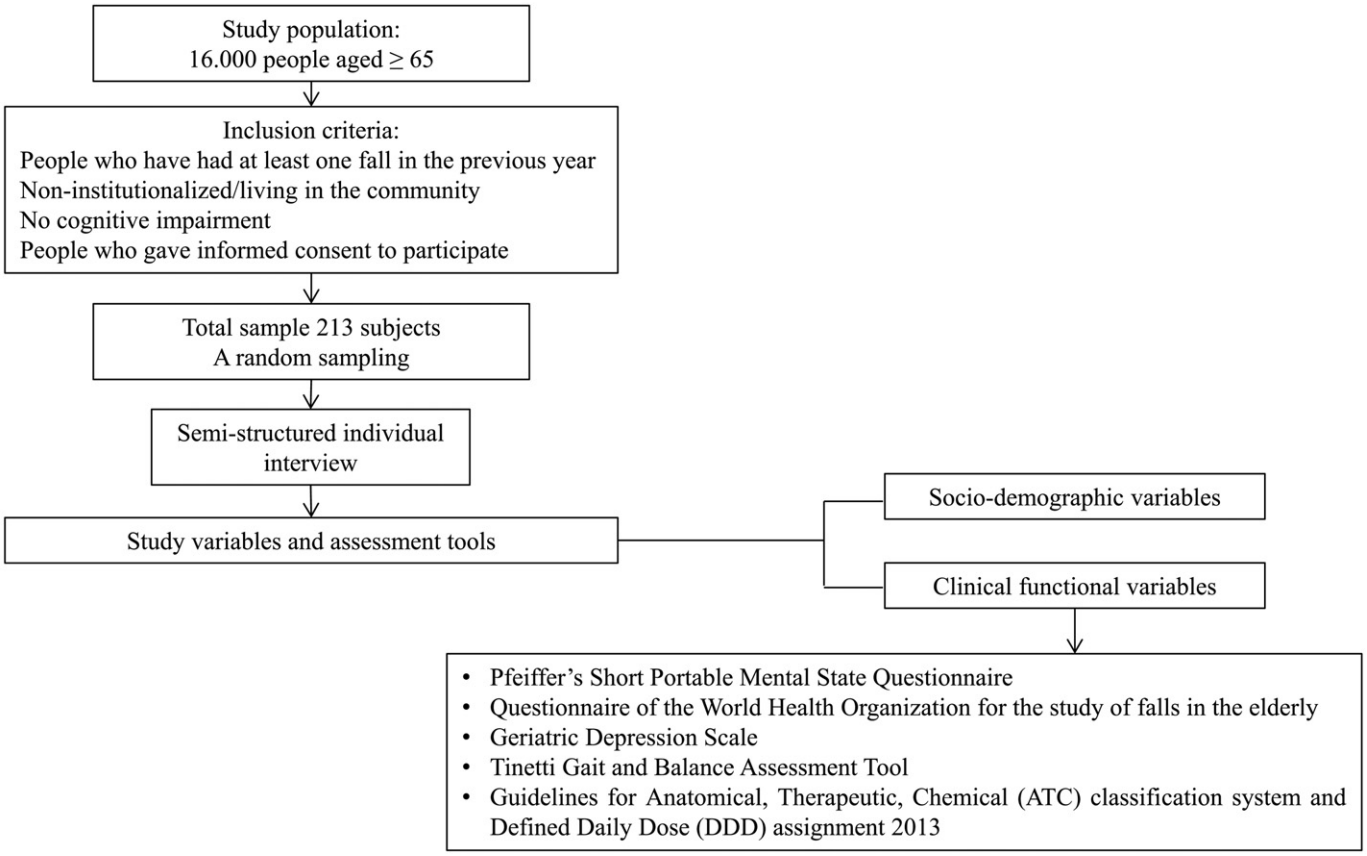


**Fig. 1.** Study design. Cross-sectional study about the prevalence of depression and associated factors in non-institutionalized older adults with a previous history of falling.

known that both depression and fear of falling are associated with deterioration in gait and balance (Iaboni & Flint, 2013). So far, very few studies have analyzed the prevalence of depression in non-institutionalized subjects, older than 65 years, with a previous history of falling. Furthermore, it is still unclear why depression is associated with falling in the elderly population. Thus, it is necessary to conduct further research that may contribute to shed light on the relationship between depression and falls in this population (Van den Berg et al., 2011).

Based on the above, the aim of this study was to estimate the prevalence of depression and associated risk factors in people aged 65 or over with a history of falling in the last 12 months.

## METHODS

### *DESIGN*

A cross-sectional descriptive study was performed.

### *STUDY SETTING AND PARTICIPANTS*

Participant recruitment took place in two social centers for older adults in the city of Zaragoza. These community-based social centers provide a common space where older adults may partake in leisurely and other activities which promote healthy aging. Our participants were selected from a total sample of 16,000 registered members. The final random sample included participants who: 1) were aged 65 or over, 2) had suffered at least one fall in the last 12 months prior to the commencement of the study, 3) were registered members of one of the selected social centers, 4) were not institutionalized in social or health centers, 5) did not have a cognitive impairment, and 6) accepted to sign the informed consent form after being informed of the study purpose, procedures and risks. The following were exclusion criteria for participation: 1) being under 65, 2) not having experienced at least one fall in the last 12 months, 3) being unable or refusing to be interviewed, and 4) scoring 3 or more in the Short Portable Mental State Questionnaire (SPMSQ). The final sample consisted of a total of 213 participants. Sample size was calculated with SPSS© (version 21 for Windows) for a 30% prevalence of falls in the chosen population, a confidence level (1- $\alpha$) of 95%, an accuracy (d) of $\pm 0.5$, a variance ($S^2$) of 13.72 and an estimated 5% drop out rate. The data were collected from May 2014 to June 2015.

### *ETHICAL CONSIDERATIONS*

This study was approved by a Clinical Research Ethics Committee, and all subjects gave informed consent prior to participation.

### *ASSESSMENT TOOLS*

Four assessment tools were used for data collection.

**The Pfeiffer's Short Portable Mental State Questionnaire (SPMSQ)** (Pfeiffer, 1975) is a brief screening tool for the assessment of organic brain deficiency in elderly patients. In its Spanish version, it consists of 11 items that assess short and long term memory, orientation to surroundings, knowledge of current events and the ability to perform simple mathematical tests. Its scoring ranges from 0 to 11, with a score ≥ 3 indicating cognitive impairment. The SPMSQ has been tested for validity and reliability, and its psychometric characteristics have been tested also in the Spanish population (González-Montalvo, Rodríguez, & Ruipérez, 1992).

**The questionnaire of the World Health Organization for the study of falls in the elderly (WHO, 1989)** (Vidán et al., 1993) was