

Fear of Falling in the Elderly - an Emerging Syndrome

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ABSTRACT

Introduction: Over the last two decades there has been a surge of interest in the phenomenon of fear of falling. This paper summarizes current data pertaining to the concept, epidemiology, assessment and management of fear of falling. In addition it elaborates on the relationship of fear of falling to other factors. Fear of falling is a conceivable cause of excess disability and an evolving public health problem.

Fear of falling has been reported in a high percentage of community-dwelling elderly who both do and don't have a history of falling. The aims of this review are to: (a) elucidate the definition of fear of falling; (b) clarify measurements of fear of falling based on its definition; and (c) describe the risk factors for fear of falling.

Key words: elderly, falls, fear of falling

Introduction

Falls are one of the most common and problematic issues among older adults (1,2). Generally, one third of community dwelling older adults had one or more falls each year (3-6). Falls were the leading cause of injury-related visits to emergency departments in the United States (7). Using data from the National Health Interview Survey, approximately 45% of all injuries in the home environment leading to medical attention were falls (8). In fact, 20% of nonfatal home falls that require medical attention occur in the over 75 age group (8).

Moreover, it has been noted that among individuals who fall, there is a high percentage (40-73%) who have a fear of falling. It has also been reported that up to half of older adults who have never fallen have a fear of falling (3,9). Fear of falling, whether or not related to a previous fall, can have a major impact on older adults. Fear of falling may be a reasonable response to certain situations, leading elderly persons to be cautious, and can contribute to fall prevention through careful choices about physical activity (10). Within this context, fear represents a reasonable reaction to possible danger and has few negative consequences as long as physical and social mobility remains unaffected. However, the fear of falling can initially present or progress beyond this point to become a debilitating condition.

In particular, fear of falling has been associated with negative consequences such as reduced activity of daily living (11,12), reduced physical activity (2,13-15), lower perceived physical health status (16), lower quality of life (2,11), and increased institutionalization (2,11)

Evolution of the Concept

Despite the importance of the percentage and the consequences of fear of falling, its definition is still vague and warrants clarification.

In the late 1970s, Marks and Bebbington described “space phobia” in four elderly women who had intense fear of falling “when there was no visible support at hand or on seeing space cues while driving” (17). These authors speculated that space phobia “might be a hitherto unrecognized syndrome or an unusual variant of agoraphobia”. Fear of falling has gained increasing attention in the public health literature over the past two decades. The concept was introduced by Bhala, O, Donnell, and Thopil (18) who used the term “ptophobia which means a phobic reaction to standing or walking. Murphy and Isaacs (1982) called it the “post-fall syndrome” in which elderly people who had fallen developed severe anxiety that affected their ability to stand and walk unsupported (19). Subsequent research demonstrated that elderly people can develop fear of falling even when they have not fallen (20-22). Other authors have stated that fear of falling means a patient’s loss of confidence in his or her balance abilities (21,23). Tinetti and Powell (24) depicted fear of falling as a progressing worry about falling that at last prompts evasion of the execution of daily activities. As indicated by Tidieksaar (25), fear of falling alludes to an un-sound absence of movement evasion because of dread of falling.

Over the years, various definitions of fear of falling have evolved. Some authors have focused purely on the fear (26), while others have included avoidance of activities as a consequence of the fear (27). A few authors have eschewed the term “fear” and have instead focused on the person’s loss of confidence in balance and walking (28,29). Currently the term fear of falling is used to describe an exaggerated concern of falling that leads to excess restriction of activities. The fearful older adult narrows their world, resulting in isolation and ultimately physical and functional decline.

So the fear of Falling (FoF) or Post Fall Syndrome or Psychomotor Regression Syndrome (PRS) is defined as: “Decompensation of the systems and mechanisms implicated in postural and walking automatisms (30)”. It appears either insidiously due to an increase of frailty or either brutally after a trauma (fall) or an operation. This syndrome is composed of a combination of neurological signs, motor symptoms and psychological disorder.

Epidemiology

Among community-dwelling elderly, fear of falling is frequent, with prevalence ranging from 21 to 61% in community-based epidemiologic studies (3,20, 26-29, 30). Community studies that are limited to elderly people who have actually fallen have reported prevalence rates of 32-83% (31,32). Strikingly, 33-46% of community-dwelling elders who have not fallen also report fear of falling (20,21).

Among selected populations, fear of falling has been found among 46% of nursing home residents, (33) 47% of persons attending a dizziness clinic,(34) 66% of patients on a rehabilitation ward,(35) and 30% of hospitalized elderly patients without a specific diagnosis (40% of those who had fallen and 23% of

those who had not fallen).(11). Some of these prevalence rates may actually be underestimates, since people who are most fearful may be less likely to participate in research studies.

Among elderly persons who are afraid of falling, up to 70% (20,27,26,30,35) acknowledge avoiding activities because of this fear. In some cases, individuals become housebound as a result of their fear. Activity restriction is, in itself, a risk factor for falls because it can lead to muscle atrophy, deconditioning and poorer balance (21, 31). Curtailment of activities can also lead to social isolation (36). Thus, fear of falling can contribute to both functional decline and impaired quality of life.

Although a higher prevalence of 40-73% has been reported in people who have fallen, studies have shown that up to half of people with fear of falling have not experienced a fall. These people have likely had a friend or family member or fellow nursing home resident experience a fall and have seen the medical and social consequences for that person. (3,9,26,36).

Manifestation

Motor symptoms

Standing

- “Retropulsion” (gravity center kept backward)
- Posterior instability (tendency to fall backward)
- Both leading to postural compensation (Knees/hips kept flexed and bend forward) and to this traditional posture:

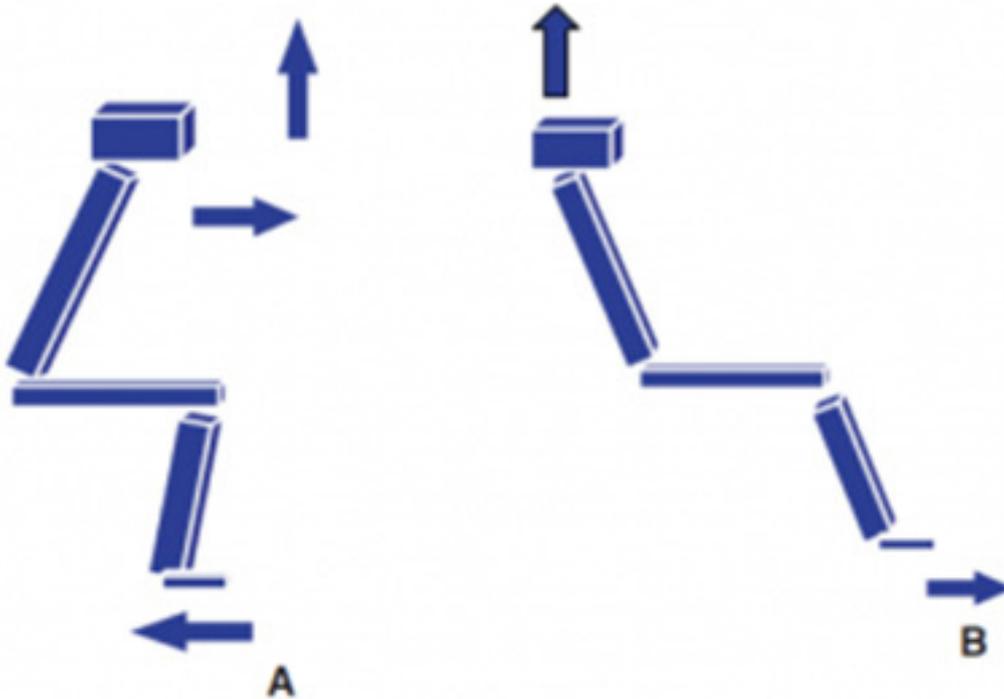


Typical anterior/flexed posture

Sitting

- Impairment of sitting posture is less visible but as problematic
- Patients with PRS keep their buttocks forward, shoulders backward and feet far from the seat (image B)
- However, to stand up we need to transfer our gravity center forward (image A)
- Therefore, standing up is difficult/impossible without exterior help for patients with PRS (image B)

A: normal way of standing up B: wrong way of standing up



Walking

It is difficult for them to

- Initiate the walk (they look like they freeze)
- Difficulty to avoid obstacle and to turn

Gait

- length of the step
- knees and hips flexion (trip risk)
- heel strike
- time spend in bipodal stance (posterior instability)

Neurological signs

- o Alteration or absence of postural adaptation (the person is not able to balance themselves and to stand up without falling).
- o Protective reaction (put their arms in front when falling to slow the fall)

Psychological disorder

Patient with PRS present with

- Anxiety/phobia of verticality (afraid to stand up)
- Loss of self-confidence/self-esteem
- Loss of motivation associated with a reduction of their activity and social interaction

Therefore, they end up in a vicious circle

- They are afraid to move
- They move less
- They become even less able to move and even more afraid

Evaluation

Measurement issues relating to fear of falling

A number of measures have been developed to measure fear of falling. Each of these measures uses different definitions and premises. Fear of falling measures are conceptualized based on the definition of fear of falling, "fearful anticipation of a fall" (37), whereas self-efficacy and confidence measures are based on the individual's confidence or belief in their ability to perform specific activities without losing balance or falling.

The FES (28) and Activities-Specific Balance Confidence Scale (ABC) (38) were developed for measuring fall related self-efficacy. The FES and ABC scales have been used repeatedly with community dwelling older adults (11,13,39-45). Fall-efficacy and confidence measures, however, may not be a true conceptualization of fear of falling because it is possible that older adults feel confident in their abilities to engage in an activity without "being concerned" about losing balance or falling, but that they could still be fearful of having a fall. Additionally, a fear-related self-efficacy measurement may not be a true conceptualization as the relationship between the fear of falling and the self-efficacy to engage in activities is likely to be strongly influenced by physical function and health status.

Fear of Falling Measures

Single item question

The simple question, "Are you afraid of falling?" was used initially in-research studies with a "yes/no" or "fear/ no fear" response format (3,40,46). The advantage of this format is that it is straight forward and easy to obtain responses. It is limited, however, as it is not possible to detect variability in degrees of fear (47), and has an uncertain relationship to behavior (28). In an attempt to overcome this limitation some researchers have utilized this single item question with a Likert scale response pattern (i.e. "not at all afraid," "slightly afraid," "somewhat afraid," and "very afraid") to reflect the degree of fear (45,48,49).

Survey of Activities and fear of falling in the Elderly

The new instrument Survey of Activities and fear of falling in the Elderly (SAFFE, Table 1) scale was developed to assess the role of fear of falling in activity restriction (50). The SAFFE uses the premise that there are negative consequences to fear, such as activity restriction or poor quality of life. The instrument evaluates fear of falling through the performance of 11 activities of daily living, instrumental activities of daily living, mobility tasks, and social activities (i.e., taking a shower, going to the store, taking public transportation, and going to movies or shows). Based on the assumption that activity avoidance may be an early sign of fear of falling, the SAFFE measures information about participation in exercise activities and social activities. The SAFFE has 11 activity items, and for each activity several questions are asked: (a) Do you currently do it? (yes or no); (b) If you do the activity, when you do it how worried are you that you might fall? (0 not at all worried, 1 a little worried, 2 somewhat worried, and 3 very worried); (c) If you do not do the activity, do you not do it because you are worried that you might fall? (0 not at all worried; 3 very worried); (d) If you do not do the activity because of worry, are there also other reasons

why you do not do it? (if yes, specify); (e) For those who are not worried, why do you not do it? (specify); (f) Compared with 5 years ago how often do you do it? (1 more than you used to, 2 about the same or 3 less than you used to). However, SAFFE is so complicated that it is not easy to administer to the elderly. Also, it is difficult to compute the SAFFE score, because it is made up of a skip pattern (51). The questions (a), (b), and (f) determine activity level, fear of falling status, and activity restrictions, while questions (c), (d), and (e) examine the number of activities that are not done because of other reasons in addition to fear of falling. In addition, the scoring range is 0-33. SAFFE is not perfect since the instructions on measurement do not elucidate whether activity and social activity should be divided when it is computed. Furthermore, there is no definition of a cut off score that means fear of fall vs. non fear of fall status. Moreover, SAFFE measures the degree that elderly feel worry during periods of activity, while fear of falling while inactive status is not measured.

The University of Illinois at Chicago Fear of Falling Measure

Veloze and Peterson (52) developed the University of Illinois at Chicago Fear of Falling Measure (UIC FFM) for the community dwelling elderly. It comprises 16 items and centers on the older adults' ability to perform activities of daily living. The measure asks the participants to indicate how worried they would be if they were to perform the activities. It is a four-point rating scale. The evidence of reliability of the UIC FFM was provided by alpha coefficient (0.93) (Veloze & Peterson), but the authors did not report any evidence of validity.

Fall efficacy measures

Fall efficacy has been used to measure fear of falling in many studies. However, as noted before, its conceptualization differs from fear of falling. Tinetti et al. (28) developed the FES. The FES is a 10 question scale, and the scores are summed to give a total score between 0 and 100. Although many authors have used the FES scale (11,13,40-42,44,45,53), the measurements are limited because the 10 items measure only simple indoor activities. The FES, therefore, is not appropriate for use with older adults who spend time outside the home and have high mobility (47). An upgraded version, the modified FES (mFES), contains an additional four questions about outdoor activities (29), and has been used in various settings (40).

Activities-Specific Balance Confidence Scale

Powell and Myers (38) developed the ABC for older adults with greater functioning, based on the definition of fall related self-efficacy as the FES. It is a 16-item questionnaire with a visual analog scale (0-100). The 16-item activities are more specific than those of the FES. The activities were performed outside of the home and were more challenging than those in the FES (16,43).

Fear of falling is one of the major issues relating to the overall health of older adults. Fear of falling leads to physical and psychological problems, and despite the large number of older adults who suffer from the serious consequences of fear of fall-

its definition is still vague and warrants clarification. From the literature review, it can be seen that the most widely used fear of falling measurements involve the evaluation of fear of falling and fall efficacy. These measurements need to be used appropriately, based on the correct definition of fear of falling. Normally, fear-related efficacy was measured with exact measurements, such as FES and ABC (54,55). However, when the study related to the measurement of fear of falling, these measurements were often misused. Fear of falling was regularly measured with either fear of falling instruments (50) or fall efficacy measurements (56-58).

Due to the misinterpretation and the misapplication of measurements, the percentage of people suffering from fear of falling may have been underestimated or overestimated. Therefore, in future research the question of whether or not the FES accurately measures fear of falling must be considered. This can be accomplished by applying both fear of falling measurements and fall efficacy instruments to the same study participants. Moreover, nurses working closely with older adults need to be aware of the different definitions of fear of falling and the FES. Although older adults may have a fear of falling, they may also have confidence in their capabilities to perform activities without falling. Therefore, nurses may be able to encourage sedentary older adults who have a fear of falling to perform specific activities that reinforce confidence with regard to not falling. Differentiating between the meanings of fear of falling and fall efficacy is very important when encouraging older adults to participate in certain activities. In short, fear of falling needs to be measured accurately with fear of falling instruments. In addition, fall efficacy or confidence as it relates to activities that can be performed without fear of falling should be measured by using the FES in an effort to clearly define each variable.

Assessment Tools

Several approaches to the assessment and measurement of fear of falling have been used and may partly explain the variability in the prevalence rates reported above. The easiest way is to ask subjects the following question: "Are you afraid of falling?" An annex of this definite method is to rate the severity of fear, ranging, for example, from mildly, moderately or very afraid.

Though a direct question is simple, up-front and simply produces prevalence estimates, this method lacks the sensitivity of a continuous measure. Tinetti and colleagues operationalized fear of falling as low perceived self-efficacy. Self-efficacy refers to an individual's perception of capabilities within a particular domain of activities (59). Tinetti, et al. developed the Falls Efficacy Scale (FES), a 10-question self-rated scale assessing a person's confidence in performing activities in the home (e.g., "How confident are you that you can take a bath or a shower without falling?"). (28). The subject rates each question from 1 to 10, resulting in a summative global score whereby a higher score is reflective of lower confidence. The scale has been modified for patients with strokes [FES (S)] (60) and to include outdoor activities (MFES). (29).

In 1995, Powell and Myers developed the Activities-specific Balance Confidence Scale (ABC); also based on the self-efficacy concept (38). This 16-item scale contains a broader range of activity difficulty and more detailed activity descriptors than the FES. It has greater reliability than the FES in detecting loss

of confidence in seniors who are otherwise highly functioning (38).

Lachman, et al. developed the Survey of Activities and Fear of Falling in the Elderly (SAFE, table 1), which examines 11 activities of daily living, instrumental activities of daily living, mobility tasks and social activities, using the questions listed in Table 1 for each activity (50). In contrast to the FES, the SAFE does not require subjects to make hypothetical responses about activities that they do not actually perform.

Associated Factors and Comorbidities

Only 10-15% of falls result in fractures or soft tissue injuries severe enough to cause immobilization or hospitalization (61). Thus, factors other than physical injury also play a role in the development of fear and restriction of activities following single or repeated falls. To date, studies that have examined correlates of fear of falling have primarily focused on demographic, physical and social variables. Multiple variables have been found to be associated with fear of falling, including those listed in Table (2) (20,27,28,32,34,35). Thus, like falling itself, fear of falling is multifactorial in origin.

A few studies have also employed depression and anxiety screening scales (4, 7,9,14,16,17). Most, but not all, of these studies found more severe scores of depression and/or anxiety among persons with fear of falling compared with those who are not fearful. In these studies, depression and anxiety scores were highly correlated. Downton and Andrews found that, of eight variables studied, depression and anxiety scores were the two most important predictors of chronic dizziness which, in turn, was significantly associated with fear of falling (20). One study found that fallers with a fear of falling were significantly more likely to score above 11 on the Geriatric Depression Scale (26). This score is frequently used as a cut-off point to indicate mild or more severe depression, raising the possibility that minor or major depressive disorders may be more prevalent among fearful than non- fearful fallers. However, to date there has been no attempt to actually determine, by means of diagnostic interviews, whether depressive and anxiety disorders are more prevalent in fearful fallers. Furthermore, there has been no attempt to determine whether specific personality traits or coping styles predict fear of falling.

Risk factors for fear of falling

Several factors that have been reported to influence fear of falling including:

Demographic influence

Increased age has been linked to increase in the fear of falling (3,9,48). However, in studies by Kressig et al. (41) and Andresen et al. (56), no significant correlation was found between age and fear of falling. In addition, women were regularly more likely to be fearful of falls than men in several studies (3,15).

History of falls

Having had a previous fall was consistently correlated with a fear of falling (3,15,48,56). Furthermore, multiple fallers and those who had a harmful fall had a higher chance of developing a fear of falling than single fallers (15). However, there are also individuals who have not fallen who account fear of falling (3,9,48).

Physical health

Fear of falling has been considerably associated with health status (3,11,15). Those with lower alleged health status were more liable to have a fear of falling (48). For instance, Cumming et al (11) completed a prospective study over 1 year with older adults who had received medical intervention at the baseline of study. They found that those who had low fall-related self-efficacy were more likely to have a poorer health status measured by health-related quality of life measures and SF-36. Furthermore, in a study by Fletcher & Hirdes, (15) poor perceived health status was found to be a risk factor for activity limitations due to fear of falling (odds ratio 1.82; 95% confidence intervals 1.47-2.26).

Morbidity

Fear of falling is more prevalent in persons with a history of neurological problems (i.e., stroke and Parkinson's disease), cardiac disease, arthritis, osteoporosis, cataracts/glaucoma, visual and cognitive impairments, and acute illness (3,11,15,56,61,62). These medical ailments effect balance and function and hence augment the individual's fear of falling. Patients with impaired gait had a greater risk of fear of falling (15,31). In addition, impaired mobility was associated with a fear of falling (56,61).

The impact of mood on fear of falling

Depression and anxiety were emphatically connected with fear of falling among community dwelling older adults (41,48,56,63-65). In spite of the fact that a causal connection amongst depression and fear of falling can't be deduced from cross-sectional investigations, it is likely that fear of falling can prompt movement limitation or social separation, which at that point brings about discouragement in the elderly (64,66). It has likewise been speculated that depression and/or the prescription being take to treat depression adds to falls and a related fear of falling (64).

The impact of exercise on fear of falling

Fear of falling decreases in older individuals engaged in exercise programs, including activities to ameliorate lower limb strength, balance, stability, and continuance, or Tai Chi exercises (16,42,45,53,67). It is likely that these activities upgraded lower leg quality, strolling speed, adjust control, and physical capacity, which diminished fall rates, and diminished the probability of a related fear of falling.

Cognitive status

Fear of falling is predominant in older adults, and may be even more common in populations known to have balance problems, such as is the situation in individuals with Parkinson's disease and dementia patients (68).

While cognitive status has not reliably been related with fear of falling, the reality of the matter is that some studies point to cognitive status just like a critical factor in connection to fear of falling among older adults in the community (31,68). Specifically, fear of falling was more apparent in Parkinson's patients with gait impairment than in healthy older adults (68).

However, fear of falling with active restriction was not related with older adults' reported memory problems (12,15). It might be that fear is extremely founded on cognitive function, but asking questions relating to fear of falling to persons with dementia poses a problem since their answers may not be valid.

Despite the high prevalence of fear of falling and its associated morbidity, there has been little research into its management.

Two fall prevention studies included falls efficacy or fear of falling as a secondary measure. Tinetti, et al. found that a multiple risk factor intervention strategy resulted in a significant reduction in risk of falling and a significant improvement in FES scores among elderly people living in the community (69). On the other hand, Reinsch, et al. found that a combination of exercise, education and relaxation training did not have a significant effect on the probability of falling or fear of falling (70).

Three randomized controlled trials have examined the effect of interventions on falls efficacy and/or fear of falling as the primary outcome variable. Tennstedt, et al. evaluated an intervention specifically designed to reduce fear of falling and improve self-efficacy in a population of community-dwelling elderly who reported restriction in activity due to fear of falling (53). Their cognitive behavioural intervention program had an immediate, but modest, effect in improving subjects' self-efficacy and increasing their level of intended activity. However, these positive effects were not present at six-month follow-up. Wolf, et al. found a statistically significant reduction in fear of falling, as well as risk of falling, among elderly people randomized to 15 weeks of Tai Chi compared to those in the control condition (45).

Finally, Cameron, et al. found that the use of hip protectors in elderly women who had fallen in the previous year had no statistically significant effect on fear of falling, but was associated with improved self-efficacy (40).

On the basis of these studies, with their varied interventions and disparate results, it is difficult to derive recommendations regarding the management of fear of falling. The multifactorial nature of fear of falling suggests that a multifaceted approach utilizing both psychological and physical interventions may stand the best chance of success, but this remains to be determined in future research. Furthermore, it is quite possible that the approach to managing fear of falling in non-fallers will differ from the approach needed for fallers.

A successful management for patient suffering from Post fall syndrome is composed of:

- o Exercise to stimulate movement and strength
- o Postural work to fix the compensation
- o Teaching patients the right maneuver on the change of position to explain the easy and safe way to stand up, sit down, and lie down.
- o Attempt to correct their gait

There are a larger number of modifiable risk factors (i.e., exercise, physical health, morbidity, history of falls, and mood status) than non-modifiable risk factors (i.e., demographic status and cognitive status) related to fear of falling.

Therefore, the team working with older adults must work with them to make positive changes to these modifiable factors by improving and augmenting their physical activity. Since, depression is one of the

critical issue linked to fear of falling (71) any strategy to decrease fear of falling should include depression management. A number of authors carried a number of intervention studies with the aim of preventing or managing fear of falling in older adults. It was clear that exercise programs, including strength training, balance, endurance, mobility, and Tai-Chi programs, have confirmed effectiveness in decreasing fear of falling in older adults (39,42,43,45,53,71,72,73). Furthermore, a meta-analysis revealed that exercise intervention is an effective way to diminish fear of falling (58). In this study, combined exercise programs with education and cognitive intervention were more effective than exercise programs alone. Furthermore, exercise within facility was less effective than home or community-based exercise (58).

Therefore making information about fall-related fear to older adults available within the community will entice fallers to minimize fall-related accidents and manage fear of falling by taking part in regular physical activities.

Future directions

Fear of falling is one of the major issues relating to the overall health of older adults. Fear of falling leads to physical and psychological problems, and despite the large number of older adults who suffer from the serious consequences of fear of falling, its definition is still vague and warrants clarification.

Further research is needed in order to better understand the genesis of fear of falling, improve its management and diminish its consequences. It would be of interest to clarify variables that may predict which individuals develop fear of falling as an “appropriate” or “protective” response to falls versus those in whom the fear is clearly pathological. A greater research focus on the psychological and psychiatric correlates of fear of falling would be helpful in this regard. Furthermore, it will be important to determine whether interventions that place greater emphasis on the specific treatment of depression, anxiety, negative cognitions and avoidant behaviors can result in improved outcome among older people with fear of falling.

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Table 1.	
Survey of Activities and Fear of Falling in the Elderly	
(SAFE)	
1) Do you currently do the activity? (yes/no)	
2) If you do the activity, when you do it how worried are you that you might fall? (not at all, a little, somewhat, or very worried)	
3) If you do not do the activity, do you not do it because you are worried that you might fall? (not at all, a little, somewhat, or very worried)	
4) If you do not do the activity because of worry, are there also other reasons that you do not do it? (specify)	
5) If you are not worried, what are the reasons you do not do it? (specify)	
6) Compared to five years ago, would you say that you do it more, about the same or less than you used to?	
Activities of Daily Living Assessed	
Go to the store	Visit a friend or relative
Prepare simple meals	Reach for something over your head
Take a tub bath	Go to a place with crowds
Get out of bed	Walk several blocks outside
Take a walk for exercise	Bend down to get something
Go out when it is slippery	

Table 2: Factors Associated with Fear of Falling
Older age
Being female
Experience of previous falls
Falls requiring medical attention
Falls resulting in fracture
Falls that occur in circumstances other than a slip or trip
Delay getting up after a fall
Recency of a fall
Decreased mobility
Poor performance on tests of balance
Chronic dizziness
Higher levels of pain
Living alone or having fewer social contacts
Poor life satisfaction
Factors suggesting frailty in the elderly, such as needing assistance to climb stairs, poor vision limiting walking, use of an assistive ambulatory device, restriction in instrumental activities of daily living and poor self-rated health

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