ORIGINAL ARTICLE

Fear of Falling in Older Adults: Comprehensive Review

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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. Despite the importance of the percentage and the consequences of fear of falling, its definition is still vague and warrants clarification. Based on a literature review, major fear of falling measurements involve the evaluation of fear of falling and use of a fall efficacy scale. Using a correct definition of fear of falling, nurses working close with older adults need to identify the different definitions of fear of falling and fall efficacy scale. In addition, nurses who work closely with older adults should encourage them to increase or maintain modifiable factors by maximizing their basic health status and enhancing their physical activity to decrease fear of falling. [*Asian Nursing Research* 2008;2(4):214–222]

Key Words elderly, falls, fear, measurement

INTRODUCTION

Falls are one of the most common and problematic issues among older adults (American Geriatrics Society, British Geriatrics Society, & American Academy of Orthopedic Surgeons Panel on Falls Prevention, 2001; Li, Fisher, Harmer, McAuley, & Wilson, 2003). Generally, one third of community dwelling older adults had one or more falls each year (Friedman, Munoz, West, Rubin, & Fried, 2002; Means, Rodell, & O'Sullivan, 2005; Tinetti, 2003; Tromp et al., 2001). Falls were the leading cause of injury-related visits to emergency departments in the United States (Fuller, 2000). Using data from the National Health Interview Survey, approximately 45% of all injuries in the home environment leading to medical attention were falls (Runyan et al., 2005). In fact, 20% of nonfatal home falls that require medical attention occur in the over 75 age group (Runyan et al.).

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 (Friedman et al., 2002; Murphy, Dubin, & Gill, 2003). 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

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cautious, and can contribute to fall prevention through careful choices about physical activity (Murphy, William, & Gill, 2002). 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 (Cumming, Salkeld, Thomas, & Szonyi, 2000; Martin, Hart, Spector, Doyle, & Harari, 2005), reduced physical activity (Bruce, Devine, & Prince, 2002; Delbaere, Crombez, Vanderstraeten, Willems, & Cambier, 2004; Fletcher & Hirdes, 2004; Li et al. 2003), lower perceived physical health status (Brouwer, Musselman, & Culham, 2004), lower quality of life (Cumming et al.; Li et al.), and increased institutionalization (Cumming et al.; Li et al.).

Although the percentage of older adults with a fear of falling is very high, and the consequences of fear of falling are deterioration in their physical and mental health, the definition of fear of falling is still vague. Therefore, there is no general consensus with regard to measurement processes for fear of falling. Essentially, there are two definitions that explain fear of falling. One definition focuses on fear itself, and the other definition points to the loss of confidence when doing certain activities due to the fear of falling. Thus when administering an instrument to measure fear of falling, both the exact definition of fear of falling and the measurements used to detect fear of falling must be considered. However, these have been ignored. For instance, in one study although the purpose of the study was to measure fear of falling, the falls efficacy scale (FES) was chosen (Andersson, Kamwendo, & Appelros, 2008; Gillespie & Friedman, 2007).

There are many factors associated with fear of falling, and there are a number of reported prevention or intervention programs for fear of falling. However, there is not, as yet, a comprehensive review of these factors. Therefore, the aims of this review are to (a) elucidate the definition of fear of falling; (b) clarify the measurement processes for fear of falling based on its definition; and (c) describe the risk factors for fear of falling.

METHODS

A thorough review of the literature was conducted in an effort to chronicle the various definitions and conceptualizations of fear of falling. Furthermore, fear of falling measurements were explained and differentiated based on each definition and conceptualization. In addition, a comprehensive review was completed with the aim of identifying the risk factors for fear of falling in older adults.

RESULTS

Definition of fear of falling and conceptualization

Fear of falling was first described as "ptophobia," which means a phobic reaction to standing or walking (Bhala, O'Donnell, & Thoppil, 1982), and was subsequently classified as a "Post fall syndrome" (Murphy & Isaacs, 1982). Other authors have mentioned that fear of falling means a patient's loss of confidence in his or her balance abilities (Maki, Holliday, & Topper, 1991; Tinetti, Speechley, & Ginter, 1988). Tinetti and Powell (1993) described fear of falling as an ongoing concern about falling that ultimately leads to avoidance of the performance of daily activities. According to Tidieksaar (2002), fear of falling refers to an unhealthy lack of activity avoidance due to fear of falling.

Measurement issues relating to fear of falling

A number of measures have been developed to measure fear of falling (Table 1). 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" (Silverton & Tideiksaar, 1989), 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 (Tinetti, Richman, & Powell, 1990) and Activities-Specific Balance Confidence Scale

Table 1

Fear of Falling Measurements

Measurement	Author	Number of items	Scoring
Fear of Falling measurements			
• Conceptualization of fear of falling – Fearful anticipation of a fall (Silverton & Tideiksaar, 1989)			
• Construct measured – Fear of falling			
Single item-Yes/No answer		1	1 = Yes, 2 = No
Single item-4 or 5-point numerical rating		1	Likert Scale (i.e. from 1 to 5)
SAFFE-Survey of Activities and fear of falling in the Elderly	Lackman et al., 1998	22	0–4 for each 6 subcategory question
UIC-FFM-University of Illinois at Chicago Fear of Falling Measure	Velozo & Peterson, 2001	16	0–4 for each item
Fall-efficacy measurements			
• Conceptualization of fear of falling – Individual's confidence or belief in their ability to perform specific activities without losing balance or falling (Tinetti, Richman, & Powell, 1990)			
• Construct measured – Fall-related efficacy			
FES (Fall Efficacy Scale)	Tinetti et al., 1990	10	0–100 < 70 = fear of falling
MFES (Modified Falls Efficacy Scale)	Hill et al., 1996	14	0–140 Higher = more functional efficacy
ABC Scale (Activities, Balance, Confidence Scale)	Powell & Myers, 1995	16	0–100 0 = no confidence 100 = high confidence

(ABC) (Powell & Myers, 1995) were developed for measuring fall related self-efficacy. The FES and ABC scales have been used repeatedly with community dwelling older adults (Brouwer, Walker, Rydahl, & Culham, 2003; Bruce et al., 2002; Cameron et al., 2000; Cumming et al., 2000; Kressig et al., 2001; Nitz & Choy, 2004; Sattin, Easley, Wolf, Chen, & Kutner, 2005; Tennstedt et al., 1998; Wilson et al., 2005; Wolf et al., 1996). 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 (Cameron et al., 2000; Evitt & Quigley, 2004; Friedman et al., 2002). The advantage of this format is that it is straightforward and easy to obtain responses. It is limited, however, as it is not possible to detect variability in degrees of fear (Legters, 2002), and has an uncertain relationship to behavior (Tinetti et al., 1990). 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," "some what afraid," and "very afraid") to reflect the degree of fear (Lach, 2005; Rucker et al., 2006; Wolf et al., 1996).

Survey of Activities and fear of falling in the Elderly

The new instrument Survey of Activities and fear of falling in the Elderly (SAFFE) scale was developed to assess the role of fear of falling in activity restriction (Lachman, Howland, & Tennstedt, 1998). The SAFFE uses the premise that there are negative consequences to fear, such as activity restriction or poor quality of life. The instrument assesses fear of falling during 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 (Huang, 2006). 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 has limitations because the instructions on measurement do not explain whether activity and social activity should be divided when it is computed. In addition, there is no definition of a cut off score that means fear of fall *vs*. non fear of fall status. Moreover, SAFFE scores the extent 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

Velozo and Peterson (2001) developed the University of Illinois at Chicago Fear of Falling Measure (UIC FFM) for the community dwelling elderly. It consists of 16 items and focuses 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 ($\alpha = 0.93$) (Velozo & 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.

Falls Efficacy Scale

Tinetti et al. (1990) 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 (Bruce et al., 2002; Cameron et al., 2000; Cumming et al., 2000; Kressig et al., 2001; Nitz & Choy, 2004; Tennstedt et al., 1998; Wilson et al., 2005; Wolf et al., 1996), 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 (Legters, 2002). An upgraded version, the modified FES (mFES), contains an additional four questions about outdoor activities (Hill, Schwarz, Kalogeropoulos, &

Gibson, 1996), and has been used in various settings (Cameron et al.).

Activities-Specific Balance Confidence Scale

Powell and Myers (1995) developed the ABC for older adults with higher performance, 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 difficult than those in the FES (Brouwer et al., 2003; Sattin et al., 2005).

Risk factors for fear of falling

There are multiple factors that have been reported to influence fear of falling.

Demographic influence

Although age has been related to fear of falling, findings have been inconsistent. Generally, fear of falling is associated with increased age (Friedman et al., 2002; Lach, 2005; Murphy et al., 2002; Murphy et al., 2003). Conversely, in studies by Kressig et al. (2001) and Andresen et al. (2006), no significant correlation was found between age and fear of falling. Also, women were consistently more likely to be fearful of falls than men in many studies (Fletcher & Hirdes, 2004; Friedman et al.; Lach).

History of falls

Having had a prior fall was consistently associated with a fear of falling (Andresen et al., 2006; Fletcher & Hirdes, 2004; Friedman et al., 2002; Lach, 2005). Moreover, multiple fallers and those who sustained an injurious fall had a greater risk of developing a fear of falling than single fallers (Fletcher & Hirdes). It should be recognized, however, that there are also individuals who have not fallen who report fear of falling (Friedman et al.; Lach; Murphy et al., 2003).

Physical health

Health status has been significantly associated with a fear of falling (Cumming et al., 2000; Fletcher & Hirdes, 2004; Friedman et al., 2002). Those with lower perceived health status were more likely to have a fear of falling (Lach, 2005). For instance, Cumming et al. 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. In addition, in a study by Fletcher & Hirdes, poor perceived health status was found to be a risk factor for activity restrictions due to fear of falling (odds ratio 1.82; 95% confidence intervals 1.47–2.26).

Morbidity

Individuals 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 are more likely to have a fear of falling (Andresen et al., 2006; Cumming et al., 2000; Fessel & Nevitt, 1997; Fletcher & Hirdes, 2004; Friedman et al., 2002; Resnick & Junlapeeya, 2004). It is likely that these medical conditions influence balance and function and therefore increase the individual's fear of falling.

As would be anticipated, individuals with impaired gait had a greater risk of fear of falling (Fletcher & Hirdes, 2004; Vellas, Wayne, Romero, Baumgartner, & Garry, 1997). In addition, impaired physical function or mobility was associated with a fear of falling (Andresen et al., 2006; Fessel & Nevitt, 1997).

The impact of mood on fear of falling

Depression and anxiety were strongly associated with fear of falling among community dwelling older adults (Andresen et al., 2006; Chou, Yeung, & Wong, 2005; Gagnon, Flint, Naglie, & Devins, 2005; Kressig et al., 2001; Lach, 2005; Niino, Tsuzuku, Ando, & Shimokata, 2000). Although a causal relationship between depression and fear of falling cannot be inferred from cross-sectional studies, it is likely that fear of falling can lead to activity restriction or social isolation, which then results in depression in the elderly (Gagnon et al.; Warr, Butcher, & Robertson, 2004). It has also been hypothesized that depression

and/or the medication being take to treat depression contributes to falls and an associated fear of falling (Gagnon et al.).

The impact of exercise on fear of falling

Older adults engaged in exercise programs, including exercises to improve lower limb strength, balance, stability, and endurance, or Tai Chi exercises were noted to have less fear of falling (Brouwer et al., 2003; Nitz & Choy, 2004; Schoenfelder & Rubenstein, 2004; Tennstedt et al., 1998; Wolf et al., 1996). It is likely that these exercises helped to enhance ankle strength, walking speed, balance control, and physical function, which reduced fall rates, and decreased the likelihood of an associated fear of falling.

Cognitive status

Fear of falling is prevalent in older adults, and may be even more common in populations known to have balance problems, such as is the case in people with Parkinson's disease and dementia patients (Adkin, Frank, & Jog, 2003). While cognitive status has not consistently been associated with fear of falling, it is true that some studies point to cognitive status as being a significant factor in relation to fear of falling among older adults in the community (Adkin et al.; Vellas et al., 1997). In particular, fear of falling was more evident in Parkinson's disease patients with gait impairment than in healthy older adults (Adkin et al.). However, fear of falling with active restriction was not associated with older adults' reported memory problems (Fletcher & Hirdes, 2004; Martin et al., 2005). It may be that fear is highly based on cognitive function, but asking questions relating to fear of falling to persons with dementia poses a problem because their answers may not be valid.

DISCUSSION

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. 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. In general, fear-related efficacy was measured with exact measurements, such as FES and ABC (Belgen, Beninato, Sullivan, & Narielwalla, 2006; Schott, 2008). However, when the study pertained to the measurement of fear of falling, these measurements were often misapplied. Fear of falling was often measured with either fear of falling instruments (Lachman et al., 1998) or fall efficacy measurements (Andersson et al., 2008; Gillespie & Friedman, 2007; Jung, Lee, & Lee, in press). 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.

There are a greater 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, nurses who work closely with older adults should encourage them to make positive changes to these modifiable factors by maximizing their basic health status and enhancing their physical activity. In particular, depression is one of the strongest factors relating to fear of falling (Van Haastregt, Zijlstra, Van Rossum, Van Eijk, & Kempen, 2008). Depression management, then, must be part of any strategy to reduce fear of falling.

There has been several intervention studies carried out with the aim of preventing or managing fear of falling in older adults. Exercise programs, including strength training, balance, endurance, mobility, and Tai-Chi programs, have proven to be effective in decreasing fear of falling in older adults (Brouwer et al., 2003; Li et al., 2005; Nitz & Choy, 2004; Sattin et al., 2005; Schoenfelder & Rubenstein, 2004; Tennstedt et al., 1998; Wolf et al., 1996; Zhang, Ishikawa-Takata, Yamazaki, Morita, & Ohta, 2006). In addition, a meta-analysis reported that exercise intervention is an effective way to decrease fear of falling (Jung et al., in press). In the meta-analysis, combined exercise programs (i.e., exercise programs combined with education and cognitive intervention) were more effective than exercise programs alone. Similarly, home or community-based exercise was proven to be more effective than exercise within a facility. Further research efforts are warranted in order to develop exercise intervention programs to decrease fear of falling among older adults. Randomized trials in which health status and efficacy expectations with regard to exercise are assessed before initiating an exercise program and then reassessed over time are required to further the understanding of the relationship between exercise and the prevention of fear of falling.

Finally, providing information about fall-related fear to older adults within the community will encourage them to minimize fall-related accidents and manage fear of falling by taking part in regular physical activities. In addition to contributing to community-based resources, this review will help gerontological nurses and resource centers to educate older adults about the importance of fear of falling prevention, and fear of falling risk factors for those who suffer from fear of falling.

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