

Abstract

Fear of falling (FoF) is as an important psychological problem amongst older people. While it has been researched for around four decades, paradoxically there is no agreed definition of FoF. Confusion over the definition of fear of falling inhibits current understanding of empirical findings. The objective of this paper is to critique current definitions of FoF and to present a novel theoretical model that aims to resolve theoretical misunderstanding. A narrative review was conducted to present definitions of FoF and concepts often conflated with it including fall-related self-efficacy and anxiety. Then, by drawing on posttraumatic stress disorder (PTSD) theory and research, we present clear distinctions between the concepts. We argue that the presence or absence of anxiety determines whether FoF becomes maladaptive or adaptive respectively, and that enhancing self-efficacy is key to optimizing post-fall psychological recovery. The theoretical clarity presented will aid future research and application of evidence to the benefit older people.

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Introduction

Fear of falling (FoF) has been recognised as an important psychological problem (Jorstad et al., 2005). Depending on how it has been measured, the prevalence of FoF among older adults has been found to be between 21 and 85 per cent (Scheffer et al., 2008). There is consensus among studies that increased FoF among older people is associated with several negative outcomes, including: reduced quality of life (Akosile et al., 2014; Patil et al., 2014), depression and decreased social contact (Scheffer et al., 2008), mobility disability (Auais et al., 2016), and activity restriction (Mendes ad Costa et al., 2012). FoF can also motivate behavioral changes that may adversely influence health status, such as poor engagement in rehabilitation (Yardley & Smith, 2002).

The effect of FoF on older adults has been found to be significant, yet the question arises: ‘What is fear of falling?’. Over the years different definitions of FoF have been created and they often fail to differentiate between fear of falling, anxiety and falls efficacy. Research concerning fear of falling dates back to Murphy and Isaacs’ (1982) classic article on ‘post-fall syndrome’. The authors recognised that after falling some people developed severe *anxiety* that affected their walking abilities. Poor definition of FoF has important implications since misinterpretation of FoF leads to misapplication of measurement tools and misinterpretation of findings. Hence, it is important to clearly differentiate FoF from other aspects such as anxiety and falls-efficacy.

Current understandings of FoF, anxiety and falls-efficacy are compromised which makes the description of the roles they play in fall risk difficult. Since the interest in FoF has been growing for over 30 years, we have come to the point when new definitions are needed of the old concepts to move forward with research and practice. Given the growing population of older adults, there is a need to develop successful interventions to prevent falls and reduce maladaptive fear of falling, but

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this can only be done when the very basis of the theory underpinning interventions is systematized and the concepts are clearly defined.

The aim of the article is to offer a shift in perspective on fear of falling. It involves the destigmatisation of FoF by separating it from anxiety. We draw on the posttraumatic stress disorder (PTSD) literature since anxiety has been researched to a greater extent in PTSD and has been found to be present in some fall survivors and can be disaggregated from other aspects of FoF or PTSD.

We question the widely-established assumption that FoF has only a negative impact on older adults, which may be related to the misinterpretation of FoF. We propose that FoF, contrary to the negative influence of anxiety, may positively affect older adults. Furthermore, it is anxiety that may be responsible for the maladaptivity of FoF. We also suggest that falls-efficacy may be the key factor influencing fall risk. In the PTSD literature, self-efficacy helps to overcome stressful situations that may follow trauma exposure (Benight & Bandura, 2004). The application of PTSD theory affords new clarity to previously conflated fall-related constructs.

We aim to advance theory, research and practice by making distinctions between fear of falling, falls-efficacy and anxiety, and present the roles they play in fall risk. The first part of the article presents an overview of the current state of knowledge in terms of the concepts, while the second part of the article addresses the variables in the new light of the PTSD literature.

Current understanding of fear of falling

Traditionally, FoF and low falls efficacy have been considered as interchangeable concepts (Tinetti et al., 1990). McKee et al. (2002, p. 329) described the concept of falls efficacy as a 'more sophisticated operationalization of FoF'. It is based on Bandura's theoretical framework of self-efficacy (Bandura, 1982). Adamczewska, N., & Nyman, S. R. (in press). A new approach to fear of falls from connections with the post-traumatic stress disorder literature. *Gerontology and Geriatric Medicine*.

efficacy which postulates that one's perceived self-efficacy affects his or her activity performance (Bandura, 1997). In this meaning, FoF should be understood in terms of one's perceived ability to engage in essential, relatively non-hazardous everyday tasks without falling (Tinetti et al., 1994).

Individuals who show greater self-efficacy persist for longer when encountering obstacles which in turn reinforces their sense of self-efficacy. That is, past successful performance reinforces self-efficacy whereas previous failings reduce self-efficacy beliefs (Bandura, 1997).

As a consequence of misinterpretation of FoF as low falls-efficacy, many researchers misapply measurement tools and misinterpret findings. For example, Delbaere et al. (2010b) reported that a high level of FoF was associated with future falls independently of the presence of physiological fall risks. Low levels of FoF protected against further falls through maintained physical activity and success in completing daily activities. However, FoF was assessed with a falls-efficacy scale therefore it is fall-efficacy that is thought to affect future falls rather than general self-efficacy or FoF.

Hadjistavropoulos et al. (2011) aimed to differentiate FoF from falls efficacy and created the Multifactorial Causation Model of Falls and Fear in which FoF and falls efficacy are distinct constructs. FoF originates from one's appraisal of their abilities to maintain balance in relation to other contributors (e.g. beliefs, falls history). The model assumes that FoF affects falls efficacy and vice versa. Furthermore, the model predicts the influence of anxiety on fall risk. As mentioned above, Murphy and Isaacs (1982) described certain *anxiety* after falling. In the more recent articles, Young & William (2015) proposed an explanation for how FoF can influence balance performance. Interestingly, in a diagram, Young & Williams (2015, p.9) did not use the term 'fear' but used 'anxiety' instead. It appears that the role of anxiety is much more poorly described in the context of falls compared with falls-efficacy. In the Multifactorial Causation Model of Falls and Fear, Hadjistavropoulos et al., (2011) clearly differentiate FoF from falls-efficacy, but do not clearly

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differentiate FoF from anxiety. The diagram of the model (Hadjistavropoulos et al., 2011, p.16) suggests that FoF and anxiety are distinct, yet treated as a cluster. This poses a difficulty in describing the relationships between the cluster and other components. Hadjistavropoulos et al. (2011) explained that one may always experience fear towards a specific situation, action, event, but one would only be anxious while performing, preparing to perform or remembering performing the action. Hadjistavropoulos et al. (2011) limited the role of anxiety to influencing activity and affecting falls-efficacy.

Treating FoF and anxiety as a cluster poses another problem, that is, they are both assumed to be negative. However, the alternative to negative FoF should be no-FoF, yet could that be considered positive? It is not clear whether anxiety affects FoF or FoF affects anxiety. Moreover, is anxiety necessary for FoF to occur? Hadjistavropoulos et al. (2011) assumed that anxiety affects falls-efficacy, but is that relationship one-directional only? To address these questions we draw on the PTSD literature which may provide a clearer picture of the concepts.

PTSD - the foundation for a better understanding

PTSD is the most commonly identified and widely investigated psychological outcome to trauma exposure with a great number of theoretical models proposed. Thus, investigating falls and fear of fall-related factors in the light of PTSD research may bring new insights into the problem of falling. Many older adults show increased levels of FoF after falling, therefore there is indirect evidence of post-fall PTSD because PTSD involves fear (Simms et al., 2002). Increased FoF is also likely to persist over time (Friedman et al., 2002) that makes it similar in that aspect with PTSD. Furthermore, post-fall FoF is often accompanied by other aspects of trauma response similar to PTSD such as anxiety, loss of self confidence and activity avoidance (Schepens, 2007).

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PTSD involves a host of symptoms: reexperiencing, avoidance and hyperarousal. It develops after exposure (directly or indirectly) to actual or threatened death, serious injury or sexual violence (APA, 2000). It is possible to define a fall as a trauma event. The National Epidemiological Survey on Alcohol and Related Conditions (NESARC) reported that unexpected serious illness/injury to someone close or their own illness are amongst the worst stressors older adults with PTSD have reported (Pietrzak et al., 2012). Previous research (Chung et al., 2009; Bloch et al., 2014; Jayashighe et al., 2014) has found that post-fall PTSD is not uncommon among older adults. Approximately one in three older adults develop PTSD after an injurious fall. However, the studies did not provide any insights into the relationships between FoF, anxiety and self-efficacy.

Fear of falling - no stigma attached

Fear is the response to present, rather than a potential threat, which is in line with Blanchard and Blanchard's (2008) distinction in relation to PTSD and contrary to Hadjistavropoulos et al. (2011) who claimed that one may be always fearful towards a specific situation, action, event, but one would only experience anxiety while performing, preparing to perform or remembering performing the action. In Blanchard and Blanchard's (2008) view, anxiety relates to subjective feelings and worries in which one's thoughts are focused on some, probably poorly specified, future bad outcome. Fear is a basic, adaptive and protective response towards a current, identifiable threat (Barlow, 2002). That implies a positive role of fear.

Traditionally, FoF appears to be perceived as always negative and no magnitude of FoF, such as protective-maladaptive, is predicted by the theory. We propose that FoF is different from any other fear since it may be innate and even positive. The evidence comes from one of the classic psychology experiments conducted by Gibson and Walk (1960). The authors faced infants with a visual cliff and the infant crawled away from it, hence, they perceived the cliff as dangerous. In that Adamczewska, N., & Nyman, S. R. (in press). A new approach to fear of falls from connections with the post-traumatic stress disorder literature. *Gerontology and Geriatric Medicine*.

sense, FoF protects from danger. FoF can even be considered as 'healthy and natural' which is protective in some cases, such as immediately after an injury FoF may prevent an older adult from undertaking relatively risky activities. On the other hand, a deficiency of FoF may cause people to undertake activities that may lead to falling. Delbaere and colleagues (2010a) found that one in three people did not hold an accurate perception on their fall risk. Too low FoF may lead to overrating one's capabilities. About 20 per cent of people reported low perceived fall risk even though they had high physiological risk therefore they could be at risk of falls that could be prevented. Allali et al. (2017) found that individuals with gait difficulties had FoF, and FoF in turn was a predictor for future falling. The authors suggested that FoF may act as a protective mechanism given their motor limitations. They also reported that FoF did not predict falls in older adults without motor limitations. Pohl et al. (2015) found no evidence that FoF is an indication of increased risk of future recurrent falls in community dwelling older people. The 11-year-long study conducted by Clemson et al. (2015) found that having an injurious fall did not predict FoF development, and similarly to Pohl et al. (2015), FoF did not predict future falls. Clemson et al. (2015) also found that profiles of people who develop FoF differed from the profiles of people who fall. Predictors for FoF were increasing age, poor physical performance, decreased social engagement, female gender and cognitive impairment. Predictors of injurious falls were increasing age, frailty and depression. It is particularly interesting that feelings of depression were found to be a predictor of injurious falls, but not FoF. Depression is an anxiety disorder, therefore the tools used to assess depression might have captured feelings of anxiety (Goldberg, 2010).

There is a certain pathological fear structure in PTSD where a number of stimulus elements that are erroneously associated with danger easily activate fear (Foa, 2011). As a result, people with PTSD process non-threat related information as a potential threat which in turn will amplify the fear (Chemtob et al., 1988). The world is then perceived as a dangerous place. The representation of how one behaved in the presence of trauma and immediately after trauma exposure becomes Adamczewska, N., & Nyman, S. R. (in press). A new approach to fear of falls from connections with the post-traumatic stress disorder literature. *Gerontology and Geriatric Medicine*.

associated with a lack of the ability to cope with the trauma. That suggests that fear of falling might be highly contextual and when one is faced with a similar context to the previous fall, one's FoF is easily activated. Hence, FoF becomes maladaptive when it is given some context and that implies fall exposure, either witnessed or experienced. Furthermore, anxiety elicited as a result of fall exposure, strengthens the experience of FoF as a result of present threat exposure, i.e. certain environmental or situational characteristics that are fall-related enhances the experience of overprotective FoF.

PTSD	FoF
Acquired	Inborn
Present only after the event	Some levels always present
High potential – always negative	Spectrum – from adaptive to maladaptive
PTSD originates as a response to trauma exposure	Maladaptive FoF originates as a response to fall exposure
Anxiety disorder with a number of fear and anxiety related symptoms	Inborn fear is linked with anxiety over unspecified future outcomes acquired after fall exposure
Enhanced negative responses towards trauma-related cues – PTSD is highly contextual.	Fear relates to present threat which must possess certain characteristics (i.e. situational or environmental) to be able to elicit certain responses – FoF is highly contextual in which the magnitude of FoF maladaptivity is related to the number of fall-related characteristics which provoke FoF occurrence
Negative associations between self-efficacy levels and PTSD severity: self-efficacy is impaired by trauma exposure but also high levels of self-efficacy translate to lower PTSD severity.	Fall-related self-efficacy is negatively associated with FoF and anxiety: higher levels of FoF and anxiety translate to lower levels of falls-efficacy; higher levels of falls efficacy translate to lower levels of anxiety and consequently to lower levels of FoF.

Table 1. The parallel between PTSD and FoF.

Negative role of anxiety

We speculate that the presence of anxiety is responsible for maladaptivity of FoF where FoF operates in the fear structure described by Foa (2011). Previous research suggests that higher levels of FoF were found to be associated with anxiety. For instance, anxiety has been reported to be common in people with high levels of FoF and fear-related activity avoidance: Painter et al. (2012) reported significant relationships between FoF and depression, anxiety and activity level. Gagnon et al. (2005) claimed that anxiety disorders have a significant independent association with FoF and they reported that intensity of FoF and self-efficacy were significantly associated with depression and anxiety. Anxiety has previously been linked with increased dizziness (Eckhardt-Henn et al., 2003), gait stiffness (Pluess, Conrad & Wilhelm, 2009) and stepping accuracy (Young et al., 2012). Furthermore, a recent meta-analysis (Hallford et al., 2017) found that elevated levels of anxiety were associated with a 53% increased likelihood of falls which indicates a negative role of anxiety in fall risk.

Self efficacy as the key factor in fall risk

PTSD appears to be associated with a failure to adapt or recover from trauma exposure, which is not common in most acute reactions to stress where corrective processes are present (Brewin, 2009). According to Bandura (1997), self efficacy is a key factor in stress reactions and coping with distressful situations. People with high levels of self efficacy can foster their own recovery by buffering against the effects of trauma exposure. Those who do not believe that their threats are manageable view many aspects of their surroundings as dangerous and to be avoided (Benight & Bandura, 2004). They magnify the severity of the threats and worry about potential threats that may never happen which in turn impairs their functioning (Benight & Bandura, 2004). In the study conducted by Flatten et al. (2008), it was found that self efficacy assessed immediately after trauma

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exposure correlated with PTSD development. Low levels of perceived self efficacy were correlated most strongly with avoidance tendencies, and avoidance was inversely correlated with positive social interactions.

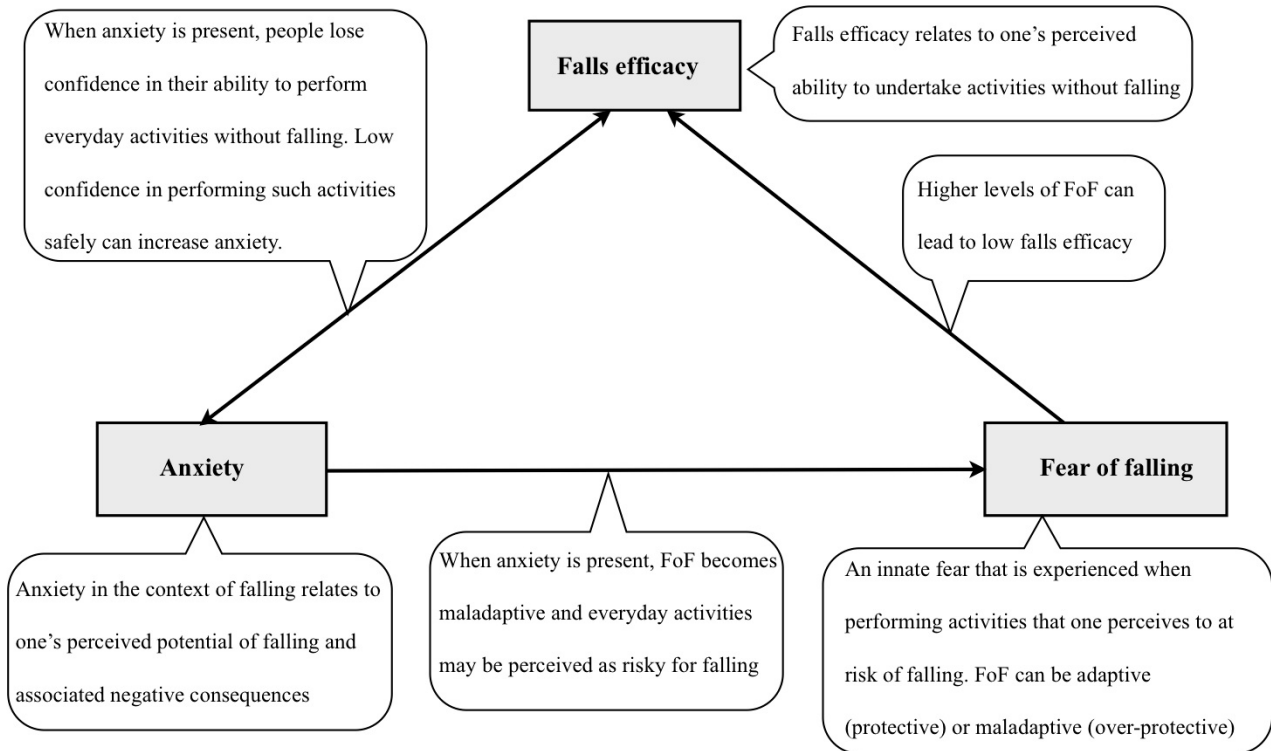


Figure 1. Model of fear of falling, falls-efficacy and anxiety

Hadjistavropoulos et al. (2011) proposed a one-directional relationship between anxiety and falls-efficacy, where anxiety affected efficacy. However, we suggest a bi-directional relationship between the variables in our model of fear of falling, falls-efficacy and anxiety (Figure 1). There is some evidence supporting the falls efficacy and anxiety interrelation; Liu (2015) assessed FoF with a falls-efficacy scale and showed that falls efficacy and anxiety are related, rather than FoF and anxiety. That is, anxiety affects the beliefs that one is able to undertake some potential activities; but also previous success or failure in undertaking activities affect anxiety levels. Failings in undertaking activities may strengthen feelings of anxiety about potential activities and that in turn fosters the experience of FoF when undertaking present activities.

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Hadjistavropoulos et al. (2011) stated that falls efficacy is related to FoF since people who are confident they will not fall will be less fearful. We propose that FoF does affect falls efficacy but in different ways depending on the presence or absence of anxiety, that is, whether anxiety leads FoF to become maladaptive. Thus, anxiety is predicted to be always negative. The model predicts one-directional relationship between FoF and falls efficacy. Falls efficacy does not affect FoF directly but via anxiety. Individuals with low efficacy do not believe they are able to manage their threats and, they tend to magnify the severity of their threats and worry about potential threats that may never happen to them which impairs their functioning. As a consequence, they perceive their environment as a dangerous place (Benight & Bandura, 2004).

When anxiety levels are low or not present FoF is adaptive; it plays a positive role and protects people from undertaking risky behaviors. Their fall-related self-efficacy is high and they feel confident about their abilities. When anxiety levels are high FoF is maladaptive; it is counter-productive by overly constricting older people's participation in daily life activities. It could therefore be expected that anxiety might also be protective since it prevents people from engaging in various behaviours and thus prevents them from falling. However, given the nature of the constructs, that is, fear relates to the present threat and anxiety relates to potential threat, they would act differently. Fear may be positive and protective from undertaking relatively risky behaviour whereas anxiety would prevent people from undertaking a variety of behaviours, depending on one's foreseen outcomes of the behaviour and consequently it may lead to activity avoidance and sedentary lifestyle. This distinction is in accord with previous research (e.g. Van Haastregt et al., 2008; Painter et al., 2012) that found a relationship between activity avoidance and anxiety. Furthermore, Vancampfort et al. (2018) reported that individuals with anxiety have a two-fold higher odds for high sedentary behaviour. That is, anxiety always results in negative outcomes.

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Future directions and limitations

To our knowledge, this is the first attempt to incorporate knowledge on PTSD to the existing conceptualization of falls risk. We have depicted the concepts in a new light and propose new functions in an updated understanding of FoF and falls. However, it is limited to hypothesising on the roles the concepts play and for this reason it needs empirical examination. We proposed a new definition of fear of falling which assumes it may be an inborn and protective fear. In order to test that, future research on various age samples may be needed to examine the experience of FoF across the lifespan.

Conclusion

We have advanced the current discussion about FoF and the constructs correlated with FoF - anxiety and fall-related self-efficacy in particular - in the light of research on PTSD. We challenged the traditional belief that FoF is always negative and instead we proposed that anxiety is the negative factor in falls risk. Self-efficacy appears to be the central mediator responsible for coping with anxiety. Important research directions could involve fallers with PTSD symptoms since they show higher levels of fear and anxiety therefore the associations between these variables may be clearer.

Conflict of interest: none

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