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Falls, Safety Fears, Low Self-efficacy, and Frailty: Can the Cycle be Broken via Exercise? A 2000-2026 Updated Overview

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Abstract

Background: Many older adults are vulnerable to falling as well as to becoming frail, and developing secondary fears of falling, and low self-efficacy for undertaking many daily functions as well as therapeutic exercises safely.

Aim: This mini review aimed to reexamine if falls, frailty, fears of falling and their association insofar as these associations can be expected to impact an older affected adults' wellbeing remain a pressing public health concern, and if so whether it is one that can be reduced or averted.

Methods: Articles extracted from major electronic data bases that addressed the current topic of interest largely between 2020-2026 were accessed and summarized in narrative form.

Results: A high proportion of older adults can be expected to exhibit frailty or become frail as they age either as a result of adopting a sedentary lifestyle or a disease response, while many are at risk for falls and fear of future falls, due to weakness and low falls self-efficacy as well as exercise efficacy.

Conclusion: Timely comprehensive assessments and tailored motor system, environmental, and behavioral interventions of the 'at risk' aging adult, including pre frail socially and physically impaired older adults, plus those who have fallen may avert serious prospective injuries and long term disability plus excess muscle and bone mass losses and their deleterious cumulative impacts on many aging older adults as well as societies.

Key words: Aging, Elderly, Falls, Falls Self-efficacy, Fear of Falling, Frailty, Intervention, Prevention, Therapy

Introduction

Aging, a generally accepted biological phenomenon implicating an inevitable declining state of organ and tissue homeostasis is frequently associated with a variety of chronic health conditions, anxiety, depression, various fears, the use of multiple pharmaceutical drugs, nutritional challenges, pain, and multiple physical limitations. Also often associated with various degrees of frailty or a tendency to become frail, this state of increased vulnerability to stress involving bone and muscle mass declines although complex to unravel is a potentially preventable critical aging determinant found to markedly increase the extent of age-associated physical, cognitive, and psychosocial challenges, as well as accelerating overall declines in well being [1, 2]. However, even though frailty is a condition expected to increase in prevalence in future years [3], the possible determinants of frailty attributable to factors other than age and nutrition, such as a high degree of cognitive challenges including the fear of falling-or a lack of confidence in one's ability to safely undertake active mobility movements, as well as sarcopenia, postural instability, and gait impairments may heighten frailty risk, or exacerbate prevailing frailty [4-6]. In addition, this scenario is hard to reverse, given the adoption and maintenance of an increase in movement safety concerns and the adoption of excess protective oriented sedentary rather than physical activity pursuits due to excess fears that could be influential in impairing health and mobility, especially in those of higher ages who are frail or who have sustained a hip fracture [7-12]. This is despite the possibility that fears evoked by the falls experience or envisioned experience of falling may mediate future falls and greater frailty especially in the face of weakness, poor proprioception or sensory impairments, as well as poor physical endurance that remains untreated or is overlooked by providers servicing a population of older vulnerable adults.

Given the growing urgency to assist older adults to avoid preventable illnesses or disability states, as well as the desire of many older adults to age 'in place', a health state amenable to prevention that predicts one or more unintentional falls and/or frailty excesses seems contrary to the idea of successful aging 'for all'. Alternately, to enable those at greatest risk for a fall or frailty state, it appears there is indeed considerable merit

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in efforts to examine their common underpinnings and inquire if some form of targeted muscle mass and reflexive muscle function building exercises using an empathetic step by step personalized process can help in this regard in some way. For example, can an improved degree of muscle function and perceptions of muscle strength help avert some falls or their magnitude, reduce uncertainty of participating in daily life, bone attrition rates, frailty and reduced vitality, and thereby a chance of increased safety perceptions and ability to function physically [12]. In particular, and in light of the severe impact of falls, as well as injuries such as hip joint and other bone fractures, will more support physical activity, especially strength and coordination training foster efforts to mitigate the rate and degree of downward spiraling of many at risk older adults, regardless of health status. As well, will efforts to help those at risk improve upon their perceived ability to control their fate and overcome any persistent fears of movement due to safely concerns. Will carefully construed primary, secondary, and tertiary preventive therapies help to encourage active participation in key life affirming self-care activities that could otherwise be predicted to progressively decline [13].

This array of observations and possible mitigating remediation approaches is not novel, but may yet prove to have considerable far-reaching utility and value insofar as prevention of excess muscle mass declines as well as bone mass and anticipated increasing degrees of frailty prevalence among many elderly who will be living in all parts of the world to high ages by 2050. The time to act though is clearly 'now' because research shows falls among older adults represent an emergent major public health concern that remains hard to capture until a major event is forthcoming. Strongly associated with pain, poor balance, depression, drug effects, gait problems and muscle weakness and wasting, a fear of falling that commonly emerges especially in the face of poor balance, postural stability, and muscle strength that can severely limit mobility, enhances vulnerability of bone and muscle mass to degradation, as well as recurrent falls risk and frailty and induces a complex feedback and feedfoward cycle of interactions and outcomes that cannot readily be reversed as depicted in Figure 1 [5, 15-20].

Specific Aim

In support of the importance of helping older adults to maintain a high level of wellness and one free from excess fears and preventable health issues, such as hip fractures, this mini review examines current thoughts as to whether there is a role for improvements in frailty prevention via efforts to avert injurious falls and their possible link to excess fears of falling and movement safety issues among vulnerable older adult populations.

A parallel aim was not only to establish if more should be done in this regard to encourage physical activity and weight bearing efficacy and their routine applications, but to examine whether evidence in this regard is increasingly supportive or not.

Review hypothesis

We hypothesized that evidence would support a bidirectional or cyclical interactive relationship between aging, falls occurrences, fears of falling and frailty that might be mediated or moderated via efforts to build muscle strength capacity and ability to respond to perturbations in a timely way. It was also believed data would show overall intrapersonal confidence perceptions and strong beliefs in one's ability to function safely in the future [18] would be harm reduction emotions and thoughts. We further hypothesized that creative dance, in combination with strength training, or similar programs designed to stimulate both motor and cognitive systems, would promote brain plasticity and functional movement improvements plus joint stability such that pain impacts as well as movement fears, limited physical and functional reliant on others would diminish [6, 21].

Relevance

Falls, as well as frailty are potentially preventable serious health states and undisputed impediments to well-being among many older populations if falls fears prevail unabated. Not only can this state impact bone fragility, but overall energy levels, muscle strength, the willingness to move, and gait capacity and stability. Frailty also commonly engenders various degrees of anxiety, and depression [6] that alone and or in combination with one or more of these aforementioned factors can be expected to not only impair safe mobility, but may foster increasing degrees of serious morbidity and excess rates of premature older adult population mortality, as well as possible parallel increases in falls risk. Frailty may also ensue post falling especially in the face of persistent or emergent neuro sensory deficits, for example at the ankle joint [11] along with various degrees of poor muscle coordination in the face of extrinsic obstacles [3].

As per Arai et al. [22] a trend towards limited physical activity participation in particular that stems from fears of falling or movement, plus low falls as well as exercise self-efficacy is likely to be significantly manifest in those aged suffering from associated co-morbid debility, pain, and kinesiophobia [19] .

This impactful health issue, while not one of high public health concern should however be examined clinically with more vigor in our view to deter the chances of otherwise increasingly excess human as well as fiscal costs especially in the frail older adult that often causes severe injury, anxiety and loss of confidence, as well as activity avoidance, depression, and social isolation, places more demands on health care resources and possibly limits the visits of 'at risk' elder to their community health providers [7, 8]. In particular, falls leading to hip fractures that occur frequently among the frail elderly not only predict less than desirable outcomes of survivors post hip fracture surgery [9], but the persistence of falls fears, anxiety, and low self-efficacy [10].

Rationale

Frailty, an age associated syndrome commonly attributed to under nutrition among other factors, appears strongly associated with a progressive decline in several physiological systems that can collectively heighten the older adult's vulnerability to the risk of multiple adverse health events and outcomes, such as disability or death [11]. In this regard, both frailty itself, as well as falls injuries often attributable in part to frailty features such as muscle and bone mass declines, can also stem from deficits in proprioception and balance, and which often produce an excess of movement uncertainty, delayed protective responses, or fears of falling that in turn may be expected to lower the ability of the affected frail aging adult to adapt to one or more undesirable stresses, obstacles in the external realm, and the chances of aging successfully with a high life quality. Yet, for many older adults living in the community and who may slowly lose their independence, a pervasive cycle of falls fears and frailty remains an enormous personal problem, and is one clearly likely to markedly raise the immense and profound social costs associated with their well established negative impacts on function, as well as social and mental health status [7, 8, 12, 13], particularly if their mindset contributes to excess falling concerns [14]. In turn, as well as fostering an increased risk for falling or actual fall injuries leading to possible protracted fears of falling, those who are sarcopenic along with those who sustain fractures may be at future risk for possible further injuries and frailty [13]. They may also present with several emergent associated negative health challenges such as the adoption of a low or absent physical activity participation level, and a higher rather than a lower odds of falls as well as fear of falling [15]. A protracted 'fear of falling' may in turn engender the onset or perpetuation of a poor life quality in its own right [16]. Indeed, a fear of falling and/or low falls efficacy appears to be

a key risk factor for frailty in older adults [17], and is one suggesting this linkage may have a possible profound role to play in terms of clarifying those frailty determinants that might be modifiable.

Methods

In accord with the aims of this report, the **PUBMED, PUBMED CENTRAL**, and **GOOGLE SCHOLAR** repositories believed to house salient topical peer reviewed articles were carefully searched. Key terms used alone or in combination included, '*aging*', '*frailty*', '*falls*', '*fear of falling*', '*proprioception*'. No yearly restrictions were applied, and after an extensive scan of the available data, all pertinent reports addressing the current topic were eligible, regardless of research design, and those deemed of substantive relevance published between 2020 and 2026 were specially sought. The method of reporting in this instance was limited solely to a narrative descriptive summary, given the low numbers of topical unified thematic papers or any well designed prospective studies on this topic. Excluded were foreign articles, falls in cases younger than 65 years of age, proposals for future falls frailty studies, nursing home studies, and issues related to frailty other than falls fears.

Search Results

General Observations

Among the articles relevant to the present topic, although limited in quantity, available data do appear to strongly support the view that many older adults are likely to be frail or in a pre frailty state, and vulnerable to weakness as well as injury if they fall. Other reports indicate that those older adults deemed to fall may cease activity due to fear and become frail, as well as experiencing diminishing health. Conceptually, this appears to set the stage for either magnifying the presence of or increasing falls and falls fears risk as indicated by Cemali et al. [19]. In particular, those elderly who restrict their weight bearing activities and others out of falling fears and who may then inadvertently suffer excess muscle mass losses, bone mineral density alterations, weakness and lack of energy, depression, and a heightened medication need, may report a low degree of self confidence in averting a fall or in participating in exercises that could help them functionally. Those who have studied this topic do not have any specific recipes for remediation, but tend to agree that this series of overlapping events is undoubtedly of high importance to acknowledge and treat.

Most current researchers clearly favor a multi pronged approach wherein exercise is key.

They also tend to agree frailty, often associated with aging is a strong risk factor for falls [22], declining muscle strength capacity, and low falls self-efficacy [24-26]. In addition, the attribute termed 'fears of falling' is also closely related to the risk as well as actual prevalence of injurious life negating falls among the elderly [25-28] and may occur or preside in over 76 percent of frail cases, with 55 percent indicating a high concern. Indeed, as observed in one study, just over 88 percent of those deemed frail indicated they had a fear of falling with a relative risk of 3.18 compared to those who were not frail. Significant predictors after controlling for other variables were female gender and the presence of depression [28].

Clearly it appears as well that a fear of falling, commonly generated in response to an actual fall could possibly induce or heighten frailty, especially among those in the higher age ranges where falls related fears appear to rise incrementally [29]. In addition age or disease associated deficits in muscle attributes including multiple domains as: muscle mass, muscle density, strength, and power are predictive of frailty states [30]. Alternately, Delbaere et al. [31] who conducted a prospective study of older adults from the perspective of falls fears, fears of movement and physical activity, and falling, was able to conclude that fear of falling had possible implications for the development of physical frailty. They further affirmed those who were female and in the higher age groups and with poorest muscle function attributes were likely to be at most risk, as noted by Di Iorio et al [30].

In another study, Silviera et al. [32] who examined elderly fallers with varying frailty designations, found higher fears of falling perceptions in those cases deemed frail compared to those deemed non frail. As well, Kressig et al. [33] who noted symptoms of activity related fears of falling to be present among at least 50 percent of older adults deemed to be transitioning to frailty, also found these fears to be associated with depression, as well as prevailing levels of functional ability. Silviera et al. [32] further concluded that frailty is indeed often associated with a heightened fear of falling, as well as reduced muscle strength, and gait abnormalities deemed to possibly lead to falls. Fear of falling that induces sedentary behavior is also likely to exacerbate the risk for incurring frailty states or worsening these, as well as falls, regardless of sociodemographic factors [35]. Other data reveal the fear of falling can not only contribute to psychological conditions such as depression, but can also impact on the physiology of gait control mechanisms and with this the health-related life quality of frail elderly people [36-38].

In short, although publication bias may be operative, it appears difficult to refute a case for the application of both timely as well as effective intervention strategies to prevent or reduce frailty among older vulnerable adults. This may not only help to reduce the chances of a high falls risk, but may also be beneficial for preventing excess frailty, future falls, as well as future falls fears among frail older adults [37] and thus a host of undesirable costly outcomes, as well as possible ineffective desirable self-care abilities [38].

Further findings [39, 40] tend to affirm that falls and fear of falling are significantly elevated in the presence of frailty and alterations in the osteo-regulatory system and with this may arise exaggerated issues of the inability to overcome health negating barriers such as fear of falling, ineffective self-efficacy, and poor self care continuity [41-46].

Clearly, although often dismissed - frailty in any form represents a highly challenging negative state of wellbeing among a high percentage of older adults as recounted by numerous authors and where it is agreed this is one health issue that clearly exposes the sufferer to a multitude of potentially preventable adverse health outcomes [41-46] often ignored until it is too late to reverse or to minimize. Conversely, in light of the rapidly ageing global population, and the parallel rise in frailty, as well as falls injuries and resultant possible fears of falling, unless evidence in support of diverse motor system and others interventions are put into practice the current social and economic burden of these two conditions alone will undoubtedly continue to rise exponentially and undesirably. Building activity participation confidence along with efforts to ensure environmental safety are strongly indicated here. In addition, those at high risk for falls and frailty should receive ongoing care.

Indeed, many current researchers feel more rather than less can be done to achieve the promise of improved health and social health outcomes for all including the vulnerable older adult who may fall or has fallen recurrently and has signs of frailty. To this end most stress a role for insightful and carefully tailored preventive strength training type approaches that currently exist such as a structured and supervised 12-week exercise program found to improve functional capacity metrics and gait biomechanical parameters related to falls, while also reducing fear of falling among older adults [6].

Successful studies imply a favorable role for multi-component community-based as well as home-based intervention approaches plus theory based therapeutic strategies to improve muscle, bone mass and function [39, 40, 44-47] and the home safety environment [45]. As well as structured exercises, strength training, or physical activities that involve functional movements and coordination exercises [48, 51-53], pain management, and/or cognitive behavioral intervention approaches to reduce frailty, as well as falls and the fear of falling may similarly help to increase independence, falls confidence, self-care and energy [7, 37, 47-50].

Further efforts directed towards reducing harmful medications, improving calcium and vitamin D status, diabetes control, and desirable home adaptations may help as well. In addition, efforts to foster a person-centered and goal setting approach that encourages cognitive restructuring, and confidence building will also likely prove helpful, as will proactive careful screening to identify 'at risk' or vulnerable high age adults [38].

Programs that try to encourage personal development and growth, in spite of aging, while mindful of optimizing physical, social, emotional, and safe environments appear highly promising as well. Task oriented therapy may also show superior effects over conventional exercise training in improving balance, gait, and balance confidence, with clinically meaningful improvements in balance, lower extremity function, and gait speed [55-58].

In this regard, Tomas et al. [2] further propose that the presence of a strong cognitive ability and reduced fear of falling are likely protective against falls and that interventions focusing on safety and resilience among the older affected adult population are indicated. In particular concerns about falling may well be attenuated in response to exercise training and efforts toward mitigating some degree of falls risk environmentally and alongside frailty dietary ramifications.

Rao et al. [42] propose possible resetting of the neural network and a roadmap that integrates antifracture therapy with functional restoration, falls prevention, cardiometabolic risk control, and inflammatory y monitoring may have real-world benefits. To this end and to improve the engagement of older adults in falls prevention interventions, the establishment of a central point of contact and individual tailored interventions, including psychological support as well as specific fall training are promising [46-48].

Discussion

While aging is inevitable, increasing evidence suggests aging as a negative state does not have to be a foregone ordained experience of downward spiraling events and perceptions. This review explored the possible contribution of fears of falling to frailty development and exacerbation, along with any observed frailty, falls-related risk associations with a view to providing more insight into opportunities to limit or avert some if not all of the related and predictable age associated adverse outcomes shown in Figure 1. These include, but are not limited to a heightened risk of disability, low levels of functional autonomy, high numbers and impact of one or more comorbid diseases, recurrent falls and falls injuries, plus multiple degrees of cognitive impairment.

On the other hand, while not definitive, and needing more careful study, it appears safe to say a fairly solid case can be made for the promise of dedicated efforts that attempt to prevent the risk of falls and frailty in high age vulnerable populations, including those elderly who exhibit persistent fears of falling and/or have fallen as a result of poor balance, postural control, and muscle weakness. As well, even though their temporal association is clearly complex and largely likely to prove non linear and cumulative undoing what is modifiable may have lasting health affirming impacts.

Indeed almost no article published within the last five years can dispute the above possible scenario and thus most favor prevention rather than intervention, although in some cases falls as well frailty risk can be somewhat reversed or attenuated. However, those who are pre frail or frail or impaired due to chronic health problems are more likely to be

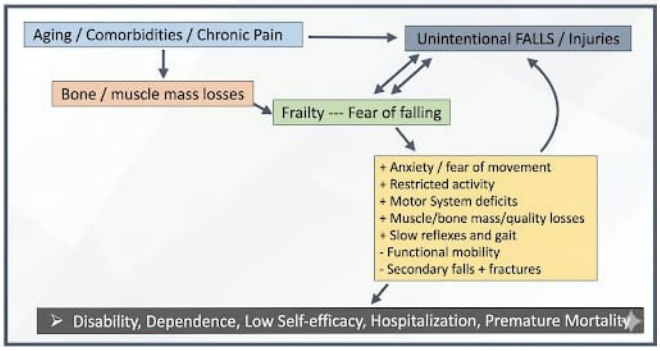

Figure 1: Conceptual Model of Multiple Interrelated Factors Potentially Impacting Frailty Cumulatively.

less autonomous and much more subject to injurious falls and in the case of a persistent focus of a past fall, may exacerbate rather than advance their wellbeing. They may become increasingly sedentary and depressed as well as exhibiting fears of moving or movements in general, develop poor perceived as well as actual balance and gait challenges, plus a loss of confidence in their ability to recover and move forwards, thus they may be highly susceptible to increases in falls risk [17, 55, 60].

At the same time, attention directed towards those most vulnerable for incurring frailty or becoming frail who appear to be women in the higher age groups, those living in poverty, those with low educational levels, those living in unsafe housing who are underweight as well as those with diabetes, dementia, disability, and/or depression [58, 59]. However, various authors propose that despite having poor balance and a falls history, many vulnerable older adults might yet be targeted successfully using the most promising personalized approaches that map those examined in randomized studies. These include, but are not limited to various forms of physical activity alone; physical activity combined with nutrition; physical activity plus nutrition plus memory training; home modifications; pre-habilitation (physical therapy plus exercise plus home modifications) [17, 60].

Alternately, in light of the independent as well as collective impact of frailty, falls, and falls fears on multiple health systems, including the possible weakening of the musculoskeletal system [16] as well as mobility, their broader social and political dimensions are incalculable [55]. The failure to address this complex burgeoning issue is indeed a pressing one and in our view demands well integrated rather than a fragmented intervention approach to avert excess costly levels of irreversible disability, hospitalization, low life quality, and possibly premature deaths [36, 38]. Moreover, although frailty may be averted through careful exercise applications and others [51], it is clear falling and the fear of falling again can become a maladaptive behavior and one occurring to a high degree as recounted by numerous current authors and as per cyclical interactions imagined in Figure 1, where these many adverse events can be hypothesized to increase over time if neglected, ignored or perceived as inevitable or irreversible.

To this end, having examined this issue for many years if not decades, it appears even if we did not cover all available reports here, ample evidence has now accumulated to support the importance of timely and well funded multiple dimensional investments and far reaching collective efforts to not only better understand why some older adults are more vulnerable to falling and falls concerns as well as to frailty than others, but to encourage falls prevention programs already in place for those at risk. Research directed towards discriminating and untangling the most promising potentially preventable antecedents of falls fears, low falls prevention efficacy perceptions, and fear-avoidance behaviors such as the use of valid self-efficacy scales and related falls efficacy enhancing strategies [26], non slip socks rather than sandals [61] plus efforts to minimize persistent pain [50]. As well, a proprioception based activity along with massage appears to have a falls risk reducing effect and lower leg muscle strength declines [62] as does an isokinetic strength training protocol aimed at balance enhancement [55]. Efforts to encourage balance-based visual reaction time exercises that may significantly improve reaction time as well as physical performance among the older adult are indicated as well [56].

Other data show that among high age chronic low back pain sufferers with signs of exacerbated multisensory movement conflicts, particularly in certain movement directions there is a clear need for balance strategies that address both sensory integration and psychological underlying or mediating factors, such as fear of falling to improve postural stability [63, 64]. A role for cognitive motor dual task interventions in this regard has also been advocated [59]

There must also surely be improved practical efforts to not only avert falls as well as falls fears, but more careful efforts to better understand the origins of both frailty as well as falls attributable and their association with excess anxieties and fears of moving that can prevail even if no fall has occurred or an actual overt falls experience is a non injurious one. Moreover, to avert the cycle of cascading events shown in Figure 1, well designed and carefully planned tailored interventions that focus on heightening muscle function, positive cognitions, falls-specific self-efficacy, and efforts to counter the multiple negative mythologies of aging and the expectation of adverse falls ramifications, including maladaptive falls concerns, untested or erroneous balance beliefs, negative mood and weakness correlates are strongly indicated.

In this regard and based on what we now know, it appears possible for a clinician to help avert a life of suffering and a heightened risk for dementia [68] and debility [69] among many high age adults, especially if they are specifically sought and targeted, empowered, and moved beyond cascading fears of helplessness and powerlessness emotions and include healthy 'agers' plus:

- Those with one or more mobility problems [63, 69]
- Those with comorbid conditions or multiple pathologies such as: fibromyalgia [21], chronic back pain [63], Parkinson's disease [65], chronic obstructive airways disease [64]; hypertension [67], multiple sclerosis [56]; sarcopenia [4, 14, 20, 41], COVID-19 [66] and diabetes diagnoses [15, 19]
- Previous fallers/those reporting multiple falls events [68]
- Adults older than 80 years of age who require living assistance [60]
- Those who are depressed, anxious, lack social support, or have dementia [7, 67]
- Those with impaired vision
- Those who are weak and physically and socially frail [67]
- Those taking diuretics, sedatives, narcotics, psychotropic, antihypertensive drugs

To ensure optimal outcomes, we specifically agree: a) knowledge of older adults' fall risk, health status, and concerns about falling should be assessed carefully and can be used to assist in the personalization and development of a more holistic fall prevention approach than not [40, 70]; b) interventions should incorporate a social support component to ensure comprehensive and lasting effectiveness for the physically and socially frail [67].

Conclusions

Based on the prevailing data, we conclude that even if it is impossible to assimilate all reports of note and the realm of study awaits future research validation-:

1. Fear of falling, a reactionary and negative emergent emotional state in response to a falls experience or an imagined fall and perceived balance shortcomings may avert the desire to move in anticipation of a negative future related expectation, especially in those older adults that are functionally impaired to begin with. That is, even though this state is not inevitable and is one that can be addressed, post falls events of fears that lead to movement and perceived safety concerns may not only be magnified in the face of frailty but may engender the onset or progression of a low mood or anxious state.
2. Personalized timely home-based community wide preventive efforts and treatments that address both frailty as well as falls fears and low falls and exercise associated self-efficacy can enable the case in question to experience a higher degree of functional ability and possible recovery post any incident falling event, regardless of whether they have been injured or not.
3. Anticipated outcomes of salient primary, secondary, and tertiary prevention approaches are the ability to live in the community independently, possible longevity, functional capacity improvements or maintenance, and a higher life quality than not.
4. Additional anticipated outcomes are feelings of personal control, reduced activity concerns and an improved self-care ability, plus considerable reductions in health care social and economic costs and resource demands over time

Personal mindful cognitive restructuring and control strategies shown over time to foster acceptance and possible falls/frailty 'benefits' as well as agency are a) thought stopping; b) visualization; c) positive self talk; d) imaginary practice; e) substituting negative thoughts with positive thoughts and actions; f) goal setting; g) self-awareness; h) strength based rather than weakness actions; I) stress control; j) anxiety reduction [71, 72].

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Conflicts of interest

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