EVALUATING FEAR OF FALLING AMONG COMMUNITY-DWELLING OLDER PEOPLE:

A qualitative pattern model based on the experience of falls

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Abstract:

The purpose of this study is to create a model grounded in the elderly people's experience allowing the development of an original instrument to evaluate FOF.

In a previous study, 58 semi-structured interviews were conducted with community-dwelling elderly people. The qualitative thematic analysis showed that fear of falling was defined through the functional, social and psychological long-term consequences of falls (Piot-Ziegler et al., 2007).

In order to reveal patterns in the expression of fear of falling, an original qualitative thematic pattern analysis (QUAlitative Pattern Analysis – QUAPA) is developed and applied on these interviews.

The results of this analysis show an internal coherence across the three dimensions (functional, social and psychological). Four different patterns are found, corresponding to four degrees of fear of falling. They are formalized in a fear of falling intensity model.

This model leads to a portrait-evaluation for fallers and non-fallers. The evaluation must be confronted to large samples of elderly people, living in different environments. It presents an original alternative to the concept of self-efficacy to evaluate fear of falling in older people.

The model of FOF presented in this article is grounded on elderly people's experience. It gives an experiential description of the three dimensions constitutive of FOF and of their evolution as fear increases, and defines an evaluation tool using situations and wordings based on the elderly people's discourse.

Keywords: fall; fear of falling; older people; community-dwelling; qualitative study; hermeneutical approach; evaluation; QUAPA.

1. Background

Falls and fear of falling are common among older people (Legters, 2002). It develops gradually, often without being noticed by either the elderly person or his/her significant ones (Piot-Ziegler, Cuttelod and Santiago, 2007). Fear of falling participates in the slow decline of the elderly person and sometimes precipitates his/her move into a nursing home (Friedman et al., 2002) and is a marker of vulnerability (Seematter et al., 2010; Rochat et al. 2010). Being able to evaluate fear of falling allows professionals to take preventive measures before the older person is caught up in the vicious cycle of decline.

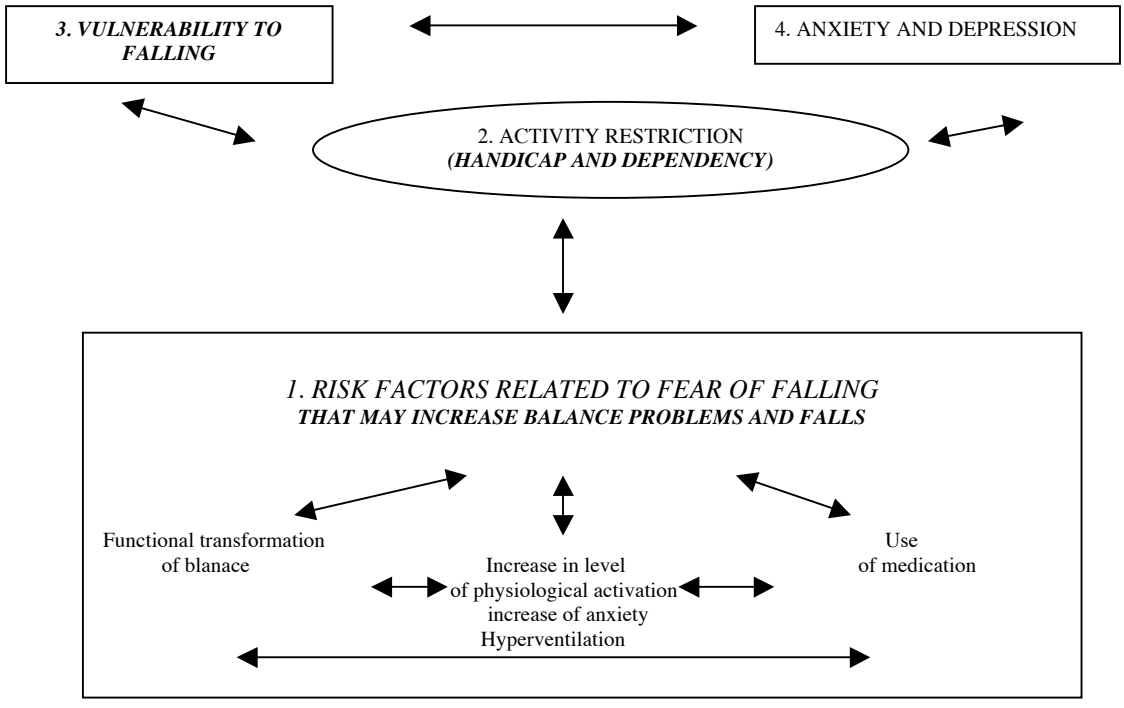

Figure 1: The cycle of decline related to fear of falling (Piot-Ziegler, 2002)

Many studies have underlined the fact that fear of falling increases the probability of falling again (Tinetti et al., 1990 ; 1993 ; 1994) and, in the past decade, great efforts have been made to evaluate fear of falling. Several authors have shown that a question such as, "Are you afraid of falling?" gives very little information about the elderly person's actual fear

(Friedman et al., 2002 ; Yardley et Smith, 2002). It is also unwelcome as older people often do not want to talk about their anxiety (Howland et al., 1998; Liddle et Gilleard, 1995). Fear of falling is most often measured indirectly through the concept of self-efficacy from Bandura's theory (1977), as fear of falling is closely affiliated to a decrease of one's feeling of self-efficacy and of physical activities[1]. Arnstein (2000) also showed a positive correlation between lower self-efficacy and recurrent falls among elderly people. These studies approach fear of falling indirectly and are often used to evaluate the outcomes of rehabilitation programs as "before and after" measures. Yet the direction of the causal link between self-efficacy, activity restriction and fear of falling has yet to be defined. Furthermore, the components of fear of falling and the way it is expressed by older people remain unclear (Legters, 2002; Piot-Ziegler, 2002; Piot-Ziegler, Cuttelod and Santiago, 2007; Dukyoo, 2008).

In our practice, we have encountered many difficulties with the measure most commonly used by professionals – the FES (Tinetti et al., 1990):

a) the older people have a hard time understanding the questions, their wording being too complex for someone not used to testing;

b) when the person no longer perfoms the activity which is evaluated, he/she finds it very difficult to project himself or herself doing it;

c) this evaluation is based on daily activities whereas fear of falling deals with emotions, subjectivity and experience.

Not withstanding its limitations, the FES (Tinetti et al., 1990), and more recently the FES-I - its modified version developed within the European project PROFANE[2] by a group of expert psychologists, physiotherapists, doctors and other professionals involved in post-fall

[1] Consequently, different evaluation questionnaires of fear of falling have been developped: the Falls self-Efficacy Scale – FES (Tinetti et al. 1990), the Activity-specific Balance Confidence scale – ABC (Powell et Myers, 1995) or the SAFFE - Survey of activities and fear of falling in the elderly (Lachman et al., 1998).

[2] PRevention Of FAlls Network Europe, QLRT-2001-02705, for further information, see http// :www.profane.eu.org

rehabilitation - are still the best validated tools available to evaluate fear of falling[3]. Although the FES-I evaluates the social and functional restrictions, it does not integrate items concerning the psychological impact of falls (for example, the emotional, cognitive or self-image changes or the existential questioning that can arise after a fall, etc.; Piot-Ziegler et al., 2007).

2.1 Summary of the first qualitative analysis' main results (thematic analysis)

2.1.1 Population

Sixty-two community-dwelling persons, aged 70 and over, and having fallen at least once in the previous year, volunteered to participate in this study[4]. Four were not eligible as they suffered from cognitive disorders. The fifty-eight remaining participants were between 70 and 96 years old (m = 82.1 years, SD = 6.5)[5] and reported different injuries from their falls, varying from benign ones (e.g. bruises and contusions) to bone fractures (wrist, ankle, hip): 53% (N=31) of the elderly people broke a bone when they fell, whereas only a minority (24%, N=14) suffered minor consequences or no consequences at all. Most participants (N=44) have fallen several times. The socio-demographical details are presented in table 1.

[3] The FES-I has many advantages to the FES: questions exploring the social restrictions due to fear of falling are explored; both the wordings of the questions – now centred directly on fear of falling - and the answers have been simplified. The English, French, German, Dutch, and Danish versions can be found on the PROFANE site (in English, Yardley et al., 2005; in Dutch, Kempen et al., 2006 ; in German, Dias et al., 2006).

[4] The participants were recruited by psychology students of the University of Lausanne, associated to this project as part of their academic program (field work in health psychology). Particular attention was given to diversity, by recruiting people living in urban and rural environments, and out from different socio-economical levels (prior profession, level of education, etc.). They were contacted through elderly people associations, as well as neighbourly and personal contacts.

[5] Men were more difficult to contact and tended not to want to be interviewed. Only 8 men agreed to participate to the study, representing 17% of our sample; this proportion is inferior to that of this age group on a national level: 39% of Swiss inhabitants are 60-80+ year old men (with courtesy to the Swiss Federal Bureau of Statistics (OFS), 2004).

	Single fall	*Recurrent falls*	*All participants*
Number of participants	14	44	58
Average age (standard deviation)	81.0 (6. 2)	82.4 (6.7)	82.1 (6.5)
Sex (%)			
Female	11 (19.0)	37 (63.8)	48 (82.8)
Male	3 (5.1)	7 (12.1)	10 (17.2)
Civil status (%)			
Married	3 (5.1)	7 (12.1)	10 (17.2)
Divorced), widow or single	11 (19.0)	37 (63.8)	48 (82.8)
Type of injury(ies) (%)[b]			
None	1 (7.1)	13 (29.5)	14 (24.1)
Soft tissue lesions	3 (21.4)	10 (22.7)	13 (22.4)
Bone fractures	10 (71.4)	21 (47.7)	31 (53.5)

[b] The percentage represents the proportion of the different types of injuries within each group of participants

Table 1. Socio-demographical data

2.1.2 Procedure

The interviewer started by briefly presenting the study and in what way the participants could contribute. They were informed that the interview would be taped and that they were free not answer a question if they did not feel comfortable with it or to terminate the interview at any

time. Particular emphasise was given to the fact that their name was strictly confidential and that they would remain anonymous throughout the study[6].

As has already been stated, fear of falling is not always openly admitted. We thus choose to introduce it through a discussion about recent falls, guided by a semi-directive interview schedule. The discussion was at first freely oriented by the participant, but certain themes (the interview schedule is described in detail in Piot-Ziegler et al., 2007) were systematically brought up with all the interviewees, when not spontaneously discussed, in order to collect comparable data throughout our interviews and to facilitate future analysis. The interviews lasted 20 to 40 minutes, and were transcribed word for word.

The thematic discourse analysis of 58 interviews with community-dwelling elderly people (Cuttelod and Piot-Ziegler, 2005; Piot-Ziegler et al., 2007) revealed the extent to which fear of falling is subjective and the importance of defining it through the life experience of the older person. The people we interviewed described in great detail the impact fear of falling had on their daily lives. Three dimensions - functional, social and psychological – were brought up systematically. These dimensions are at the basis of fear of falling's definition. The results also showed that admitting to one's fear of falling is very destabilising as it confronts the older person to his/her increasing dependency and frailty and thus forces them to reappraise the image they have of themselves. The desire to keep up a positive image for oneself and in front of others was underlined by several people. Rather than ask a direct question such as "Are you afraid of falling?" that seems to jeopardise the elderly person's positive image, fear of falling can be more easily apprehended through a discussion about the functional, social and psychological consequences of falling, based on experiences taken from their daily lives. This is far less threatening for the older person.

[6] Before starting the interview per se, the participants were invited to ask questions and to voice their concerns. If they agreed to participate, they were asked to sign two informed consent forms (one was theirs to keep and the other one was for the researcher).

- Fear of falling and functional activities

Elderly spontaneously referred to specific activities eliciting avoidance, special attention or even fear. These activities are detailed in Table V, and compared to the Falls-Efficacy Scale items (Tinetti et al. 1990; Tinetti et al. 1994).

"FES" item used to evaluate FOF through "self-efficacy"[a]	*Activities cited by elderly inducing FOF by frequency*	*Items found by Velozo & Peterson (2001)*[b]
	Go out in bad weather (snow, rain, wind, ice)	**Walk when icy**
Going up and down stairs.	**Go up and down stairs**	**Climb stairs (divided into 3 more precise items)**
Walking around the neighbourhood	**Go out (more extended fear than the FES item)**	**Take a walk**
	Trip on rugs	Carry bundles up poorly lit stairs
Getting dressed and undressed	**Get on and off the sidewalk**	**Step off a curb onto the street**
Preparing simple meals	**Get up and down a chair**	**Use a step stool to reach in kitchen cabinet**
	Walk	
Taking bath or shower	**Taking shower or bath**	**Get in/out of bathtub**
	Generalised fear no matter the situation	Stand on a moving bus
Simple shopping.		Carry bundles up well-lit stairs
Get in/out of a chair	Slip on the floor	Walk on a crowded sidewalk
Reaching into cabinets or closets	Take the bus or the train	Use an escalator
Going to answer the telephone before it stops ringing	Go outside in the garden (uneven ground)	Get in/out of a car
		Carry a full plate to the dinner table
	Get out of bed	Pick up something lightweight of the floor
Cleaning the house	**Cleaning the house**	

[a] Items similar to those found in this study are in bold. [b] Items similar to those found in this study are in italic.

Table V Comparison between the FES items and the most feared activities spontaneously cited by the interviewed elderly

Activities pointed out by the elderly in this study are listed in order of decreasing frequency from 1 (most frequently cited activity) to 7 (less frequently cited activities). Qualitative analysis showed that most of the daily activities spontaneously described as inducing the higher anxiety are different from the items explored by the "self-efficacy" scale. Only four FES items were identical. The FES activities although relevant from a self-efficacy perspective do not seem here to represent the most feared situations from a phenomenological perspective. These results suggest also that if health care professionals' activities selection, as showed in the research of Tinetti and al., (1990), is relevant from a dependency perspective, or represents an objective evaluation of disability, it doesn't though superpose to the subjective fear experienced by the elderly in their everyday life (Cuttelod and Piot-Ziegler, 2005; Piot-Ziegler, 2002; Piot-Ziegler et al., 2007). These results however, even if based on a much smaller sample, compare to those obtained on a large sample study by Velozo and al. (2001), although items were not always labelled exactly in the same way, or may vary due to cultural variations.

Going out and moving in general is causing fear not matter the context is. Activity in itself does not induce fear, at least not in the lower level of FOF, but it is the movement and its combination with the "quality" of the environment (smoothness of the floor, unexpected obstacles, bad weather). Physical impairments are increased by environmental dangers. If these situations may seem at first loaded with subjectivity, they may well appear "reasonable" and quite pertinent as they endanger postural stability and balance. Postural threat and fear of loss of balance or tripping are risk factors for falls and have already been pointed out in previous research for elderly population (Hatch and al. 2003) but they also modify the walking patterns and the postural control even in younger people (Adkin and al. 2002; Pijnappels and al. 2001; Carpenter and al. 2001). Anxiety adding up may worsen ability to

move and possible recovery from balance disorders (Yardley and Redfern, 2001).

The FES-I (Yardley et al ; 2005) developed in the context of the European project PROANE has added questions exploring aspects mentioned by the older people in our study and has also simplified the wording of the questions. This modified version of Tinetti's FES focuses on concerns rather on self-efficacy. But it does not explore other psychological aspects that came out of our first analysis, such as the possibility of resiliency, depression, isolation, fear of institutionalisation, the challenge on identity, the feeling of frailty or the existential questioning. Yet these aspects are associated to falls and influence the way they are experienced as the development of fear of falling. Furthermore, the first analysis of our interviews reveals the importance of temporality linked to the development of fear of falling. Beyond its immediate impact (injuries, fear, etc.), the fall has long term consequences that can influence the elderly person's life for a longer period and that give rise to existential questions concerning self-image and identity and how fear of falling can be decomposed into three different dimensions: the functional, social and psychological dimensions (Piot-Ziegler et al., 2007). As intensity of FOF was expressed differently from on person to another, we developed an original secondary analysis presented in this article.

The objective of this secondary analysis is to search for possible patterns in the older people's discourse.

2.3 Secondary QUAlitative Pattern Analysis (QUAPA)

Two researchers (TC and CPZ) independently analysed the 58 interviews realised in the prior study (Piot-Ziegler et al., 2007) with an original analysis method, the QUAPA (QUAlitative Pattern Analysis). The aim of this analysis was to bring forth possible patterns in the elderly people's discourse across the three dimensions (functional, social and psychological), which could coherently describe the intensity of fear of falling. This pattern analysis followed four steps:

- at first, the researchers focused on the specificities of each participant, and considered the heuristic value and internal coherence of the discourse (intra-individual patterns of the three social, functional, psychological dimensions); this first step revealed the internal logics behind each participant's discourse;
- then independently each researcher classified interviews, according to the similarities in the patterns of the three dimensions or post-fall reactions;
- the two researchers' categorisations were confronted and inter-judge agreement was obtained;
- finally a synthetic model of fear of falling was formalised. (cf. table 3).

3. RESULTS : THE FOUR INTENSITY LEVELS MODEL OF FEAR OF FALLING

The analysis of the 58 interviews using the QUAPA method revealed that the participants could be divided into four groups, depending on the patterns found in the reported social, functional and psychological consequences. Older people:

- who are not afraid of falling (NF – 46,6% of the participants);

- who are moderately afraid (MF - 31% of participants);

- who are constantly afraid of falling (CF - 13.8% of respondents);

- and the older people who suffer from intense and often disabling fear (IF - 8.6% of our sample).

To each group corresponds a coherent pattern of functional, social and psychological consequences (cf. table 3). Each level will be described in detail bellow.

- No fear (NF)

The elderly people in this group report temporary inhibitions due to their fall(s), which disappear as they physically recover. There are no changes in their social life and functional

status. They sometimes mention positive consequences to their fall, such as getting more attention from their social environment (friends, family, neighbours) or their pride in having been able to get back up unaided: *"When I opened my eyes, at the hospital, everybody was really nice to me. I also got a lot of phone calls from people who were worried about me."* (32, 2, 5).

Resiliency, being pleased by their prompt recovery and having reappraised their strength of character (determination) are also reported: "*I am a fighter! Even if I know that it can be the end tomorrow or the day after – you never know – I will fight until the end!"* (18, 5, 14).

The following elderly man openly talks of the danger of falling, although it does not scare him. He talks about it naturally, as a possibility that exists but does not generate negative feelings:

> *I am not afraid of falling even though I know that it can happen, because I live in a country that will soon be covered in snow and the roads will be icy; that is the only thing that worries me (…) but it is not fear. I just know that I have to be ready for it.* (43, 3, 44)

- Moderate fear (MF)

This group of older people is very aware of the danger of falling. Since they have fallen, they are more wary and careful when moving about: *"And now it's over, I don't feel anything anymore, but it doesn't matter… you're still careful. You are really aware that an accident can happen at any time."(01,3,23)*

They have often reduced their social outings and on a functional level, these people describe how they feel the years creeping up on them: *"It is difficult, because up until now, I was always running about. But now I have to slow down, and it is not easy [to accept]."* (12, 3, 36).

They also mention feeling more secure using a walking device (e.g. a cane), especially when outdoors, even if it is not an obligation: *"[The cane] is very useful. Especially now that I am a little afraid of falling, it is really useful […] You know, I would never go out without my cane […] Well, not to go shopping in the village. Only if I go out for a walk." (44, 3, 27)*

- Constant fear (CF)

Fear of falling is a constant companion to this group of respondents. It really incapacitates them and is a handicap in their daily lives. An 84 year-old woman describes her fear as follows:

> *Oh yes! I am always afraid, even though I am really careful. I don't know why… I hope I will die before having to move into a nursing home. I'm afraid I'll break something, even if luckily, I don't have osteoporosis! (25, 1, 48)*

People suffering from constant fear only go out when accompanied by another person, which means that they are very dependant on their social environment (for example, their family and neighbours): *"[I walk] very slowly! I constantly need to stop… and then I go one, but very slowly. An now, I can't even go to the village alone anymore."* (58, 2, 44)

Solutions can sometimes be found to their functional difficulties. An elderly person can maintain a certain degree of independence through the help of others. A 75 year old woman explains that the falls *"have changed a lot of things for me. I swore that I would never fall again and that I would find the strength to keep control. I do what has to be done so that I can take care of myself in order not to live in a state of constant fear, or with the fear that one day, I won't be able to get back up."* (04, 3, 24)

Finally on the psychological level, these people complain of lower spirits and of feeling lonely because of their functional and social limitations. The help of their significant ones and their moral support are essential in maintaining a positive image:

> *All I ask is morally… nobody can stop me from falling. I think that's my own problem. The only thing I ask [of my family] is that they don't let me down. That way, I won't fall [physically and morally]. (04, 4, 2)*

- Intense fear (IF)

The respondents of this group are dependent of their social environment. They cannot take one step without physical support and without help. They are haunted by this fear when outdoors but also when walking in their homes:

> *I'm always looking at the ground. Because if I lose my balance, I fall […] That's why I'm so careful. […] I'm even afraid indoors.* (30, 1, 42)

> *I hold onto the furniture. Yes, I hold onto everything.* (08, 2, 5)

An 84 year old man explains: *"I depend on my wife for all the activities I used to do alone. Even for little things like getting dressed."* (23, 2, 12). Social and physical activities are restricted or even impossible, and at this level of fear, there is a high risk of depression: *"I cry all the time, for anything and everything, because I have to stay home all the time."* (33, 1, 16).

The image these older people have of themselves is modified due to their feelings of frailty and their poor physical state:

> *Now I'm afraid of falling and of getting badly hurt. Because I suffer from arthritis in my knees, feet and hands, I am as breakable as glass.* (30, 2, 17)

Table 3 summarises these results of the QUAPA analysis and shows how the four intensities of fear are defined by different patterns in the psychological, functional and social consequences. The percentages refer to the proportion of elderly people in our sample suffering from a specific level of fear.

Table 3. Four level model of fear of falling

N =58	***Functional consequences***	***Social consequences***	***Psychological consequences***
1. NO FEAR (46.6%)	Temporary changes following the fall, or no changes in physical activities; The elderly person is fearsome only in extreme conditions and still able to face environmental constraints.	Positive social consequences or no social consequences; Social life is maintained, sometimes increased (social calls from friends and family)	No psychological changes; Fall may be seen as a positive experience (resiliency); The risk of falling is acknowledged but does not provoke negative thoughts.
2. MODERATE FEAR (31%)	Most physical activities are maintained, by compensating physical impairments: They are particularly	Social life is restricted ; Certain outings are abandonned, while others are maintained with compromises or	Increased awareness of the danger of falling on the cognitive and affective level; Maintaining active life necessitates important

N =58	*Functional consequences*	*Social consequences*	*Psychological consequences*
	attentive when moving about; Modified gait, more focus on the environment (obstacles, dangers); Onset of dependency, occasional use of walking devices (e.g. cane), especially outdoors.	precautions (having somebody to drive them to specific places, or being accompanied).	cognitive will and motivation; Falls are constant reminders of frailty and are perceived as a real danger.

3. CONSTANT FEAR (13.8%)	Need of help from another person frequent use of walking aids when outdoors and sometimes indoors too (holding on furniture, leaning on walls, etc.); Slow gait, frequent stops; Necessity of adapting their homes (bathtub, chair, raised toilet seat, hand rails, etc.); Certain physical activities are given up.	Social life is reduced; Increase of dependency on others (family, neighbours) to maintain the remaining social life.	Feelings of dependency Sadness due to the awareness of the high risk of falls; Feelings of loneliness; Constant alert and vigilance while walking; Movements require more and more drive and motivation Fear of institutionalisation.
4. INTENSE FEAR (8.6%)	Modified posture and gait; Help needed for all moves (rails, walls, furniture, canes, person to hold onto); Confinement at home.	Independent social life is impossible; Total dependency as help is needed for all daily activities.	Fear is explicitly expressed; Outdoor and indoor environments become unpredictable, even threatening (obstacles); Feelings of frailty, awareness of approaching death; Resignation, powerlessness; Depression, negative fatalism; Institutionalised is needed.

4. CONCLUSION

Falls are an important turning point in the lives of older people. Fear of falling is related to the subjective appraisal of the fall and to its long-term consequences (Piot-Ziegler, et al., 2007). Although the necessity to evaluate the functional abilities, fear of falling and the general degree of dependency is widely recognised (Suzuki et al., 2002), basing this evaluation solely on the concept of self-efficacy or on activity restriction is currently questioned (Piot-Ziegler, 2002 ; Mc Kee et al., 2002 ; Piot-Ziegler et al., 2007) as these dimensions do not take into account the subjective and experiential aspects.

Prior research (Yardley et Redfern, 2001; Yardley et Smith, 2002 ; Brouwer et al. 2003 ; Adkin, 2003) has shown the importance of the functional, social and psychological aspects. The four level model of fear of falling presented in this article reveals the logics and the coherence in these three dimensions of fear of falling. Each degree of fear of falling is defined by a specific pattern of functional, social and psychological long-term consequences of the fall.

Fear of falling gradually develops, and at first professionals or close one's do not detect it. This model can be used to appraise the older person's status, through the reported impact of fear on their identity, image, activities and social life. This model is grounded in the life experience of the older person. It takes into account the functional, social and psychological long-term progressive restrictions. Piot-Ziegler et al. (2007) have demonstrated the importance of these three dimensions in fear of falling definition; they have been identified as key aspects for rehabilitation (Bruce et al., 2002).

On the basis of these results, we have created an instrument specifically tailored for older community-dwelling people (for fallers and non fallers), consisting of four portraits, each representing a degree of fear of falling: a practical, and forthcoming tool for the older person

(portraits-evaluation for fallers, and non-fallers, and guidelines for evaluation are currently only available in French). Each portrait consisting in examples grounded in the discourse of the older people's interviews. By filling up this simple evaluation, the elderly person can realise where she situates him/herself in the fear of falling intensity scale, and his/her degree of frailty can be easily estimated. It can also be used to better tailor preventive or rehabilitation programs in bringing up to light the underlying representations of the older person and to plan interventions. This portrait-evaluation is only available in a French version and is currently tested, and compared to the validated FES and FES-I.

Evaluation of FOF using the "self-efficacy" concept or activity restriction (ADLs) is questioned in recent research and may well measure a functional ability rather than the actual experienced fear of falling (McKee and al., 2002). Though thorough evaluation of these dimensions, preventive measures and rehabilitation can be developed and adapted to the needs of the older person. A rehabilitation that must not only focus on functional aspects, but that must also integrate the psychological foundations of this fear.

This model should be validated on a larger sample of community-dwelling older people, on people who have never fallen and on fragile rehabilitation populations, and its sensitivity compared to that of currently used evaluations, such as the FES-I (Yardley et al. 2005) or the French validated adapted FES (Büla et al. 2008) versions.

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