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Effects of a Fear of Falling on Patients Undergoing Surgery for a Fracture of the Proximal Femur and Factors Leading to the Elimination of that Fear

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Abstract. [Purpose] We sought to clarify factors leading to the elimination of a fear of falling.[Subjects] Forty females with femoral bone fracture were the subjects of our study.[Methods] The fall efficacy and motor and psychological functions of the 40 patients following fracture of the proximal femur due to a fall were measured weekly from week 1 to week 4. These subjects were then divided into two groups.[Results] There were differences between the 2 groups of subjects in terms of MFES scores and state anxiety during week 2, 3, and 4. Comparison of the groups of subjects between week 1 and week 4 indicated that both groups of subjects had improved motor function and that subjects with no fear had improved MFES scores.[Conclusion] These findings reveal that improved motor function can be expected even if the individual has the fear, but the fear will not be lost through improvement of motor function alone. Additionally, subjects with no fear tended to have greater fall efficacy. The results suggest the need for steps to improve fall efficacy in order to eliminate the fear.
Key words: Fracture of the proximal femur, Fear of falling, Fall efficacy

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INTRODUCTION

Recently, attention has focused on the fear of falling as a psychological impact of a fall. This fear of falling has several effects[1)]; it reduces an individual's range of behavior and leads to diminished physical function as a result of reduced activity. It can also diminish quality of life and increase the future risk of falls. In addition, a study of patients with a fracture of the proximal femur[2)] indicated that a fear of falling, as a factor that inhibits improved physical functioning, has more of a negative effect on that improvement than the presence or absence depressive symptoms or pain. Fear of falling is reported to diminish the effectiveness of the rehabilitation. The incidence of a fear of falling in the elderly ranges from 50% to just under 70%[3–5)] in studies of community-dwelling elderly in Japan; the incidence was around 80%[6)] in individuals seen as outpatients and over 90%[7)] in the elderly residing in facilities, and just under 60% of individuals who had fallen had a fear of falling while about 40% of individuals who had not fallen had that fear, indicating that individuals who had fallen were somewhat more prone to having a fear of falling[8,9)]. In reports from abroad, the fear of falling in community-dwelling elderly varies widely from 10–80%, but most reports cite an incidence of about 40–60%[10–14)]. This rate is roughly equivalent to that reported in Japan. Thus, a number of the elderly have a fear of falling both here in Japan and abroad. This fear is a serious health problem that is linked to diminished mental and physical functioning of the elderly. In the last few years, numerous studies have been conducted on factors associated with a fear of falling. Depression, anxiety, and reduced attentiveness are psychological factors[15–17)] that have been found to be associated with a fear of falling; in terms of motor function[18)], muscle weakness, diminished balancing ability, and diminished ambulatory ability are reportedly associated with a fear of falling. In addition, numerous reports have noted a higher proportion of individuals with a fear of falling among the elderly, individuals who had fallen, and women. Moreover, individuals are thought to have a more intense fear the more times they have fallen. That said, a cross-sectional study of the frail elderly found no association between then fear of falling and physical function[19)], and reports have indicated that improved ambulatory ability and balancing ability did not alleviate the fear of falling[20,21)]. Studies on factors associated with the fear of falling have yet to reach a consensus view. Intervention studies that include fear of falling as an

assessment index have described interventions[22] that are mildly effective at alleviating the fear of falling. These interventions include Tai Chi to improve balancing ability and provision of therapies such as cognitive behavioral therapy as an approach to behavioral and attitudinal modification. The reality, though, is that there is no consensus on intervention strategies either.

Factors associated with fear of falling, which diminishes the quality of life of the elderly, have been clarified in numerous studies, but a consensus view has yet to be reached. In clinical settings, some elderly immediately following a fall-related fracture lost their fear of falling while some retain that fear. For individuals who retain a fear of falling, it may become a major obstacle to their recovery of function. Moreover, some individuals retain a fear of falling despite a high level of physical function while some individuals will lose their fear of falling despite a low level of physical function. Many previous studies have examined local elderly residents and elderly residents of facilities. No studies have yet longitudinally examined the relationship between a fear of falling and the mental and psychological functions of elderly patients immediately after a fall, which is when they are susceptible to a fear of falling. Thus, the current study sought to longitudinally study and clarify the effects of a fear of falling on improved physical function of in patients during the acute phase following a fall-related fracture, which is when patients are susceptible to a fear of falling and circumstances have changed little. This study also sought to longitudinally study and clarify differences in motor and psychological function in individuals who had lost their fear of falling and individuals whose fear of falling remained.

SUBJECTS AND METHODS

Subjects

Subjects were 40 elderly females (age: 79.2 ± 6.4 years, height: 150.8 ± 6.9 cm, weight: 47.6 ± 9.2 kg) who experienced a fracture of the proximal femur due to a fall. These patients underwent surgery at our hospital and were given the clinical pathway for treatment of that fracture. Potential subjects took a cognitive function test (the Mini-Mental State Exam, or MMSE)[23] and those scoring under 24 points, signalling a likelihood of dementia[24], were excluded. Also excluded were individuals who scored 24 points or better but who lacked the cognitive function to understand the items being measured and individuals who were unable to walk unassisted or with a cane prior to the injury. A "fall" was defined as "an unintended fall onto the ground or lower surface".

In terms of ethical considerations, details of the study were explained to subjects verbally and in writing, and signed consent forms were received from subjects. This study was approved by the Ethics Committee of Kobe Ekisaikai Hospital (Approval no. 2009-03).

Methods

Subjects were patients following surgery who were given the clinical pathway for treatment of a fracture of the proximal femur. Subjects were initially assessed during the first week postoperatively and assessed weekly for 4 subsequent weeks in terms of the items described below. Depending on whether the subject had or did not have a fear of falling after 4 weeks, the subject was designated as a subject who retained a fear of falling, i.e. a subject with a fear of falling, or a subject who had lost her fear of falling, i.e. a subject with no fear of falling.

Basic information on subjects included their age, height, weight, and body mass index (BMI). Intellectual function was assessed using the MMSE.

The Functional Independence Measure (FIM) was used to assess subjects' activities of daily living (ADL).

The Falls Efficacy Scale developed by Tinetti et al.[27] and modified by Hill et al.[28] to include outdoor activities (Modified Falls Efficacy Scale, or MFES) was used to measure the extent of the fear of falling. The MFES is based on the theory of self-efficacy, which refers to the confidence to do something one was able to do before, and assesses an individual's confidence in being able to perform an activity without falling. On a scale of 0–10 points, subjects rate their confidence at being able to perform 14 activities without falling. A higher score indicates a less intense fear of falling. In addition, whether a subject has a fear of falling or not is measured by the subject's direct response of "yes/no" to the question "Are you currently afraid of, or worried about falling?"[29].

To test psychological function, depressive symptoms assessed for using the Geriatric Depression Scale (GDS)[30], attention was tested using the Trail Making Test, Part A (TMT-A)[31], and the level of anxiety was determined using the State-Trait Anxiety Inventory-Form JYZ (STAI)[32].

Motor function was evaluated in several ways. Balance was tested using the Functional Reach Test and Timed Up-and-Go test. Ambulatory ability was gauged by the time to walk 10m (10mWT). Knee extension strength was measured as an index of muscle strength on the unaffected side and the affected side.

The Functional Reach Test (FRT) was administered using the procedures of Duncan et al.[33]. Specifically, the subject stood with the feet shoulder distance apart. In the starting position, the subject had her shoulder on the dominant side raised to 90° of flexion, her elbow extended, her wrist in the neutral position, and her fingers extended. On a measure running horizontally along the wall at the height of the subject's acromion, the distance traversed by the middle finger of the reaching hand was measured in increments of 5 mm. Measurement was done twice, and the maximum distance served as the reach.

The Timed Up-and-Go test (TUG) was administered using the procedures of Podsiadlo et al.[34] A stopwatch was used to measure the time from when the subject stood up from a chair with armrests, walked 3 m, changed direction, walked back to chair, and sat back down in the chair. Measurement was done twice, and the fastest speed served as the time taken.

Ambulatory ability on level ground (10mWT) was tested indoors on a 16-m long straight path. Subjects were instructed to walk along the path at a self-selected pace. A stopwatch was used to measure the time from when the subject passed the measurement starting line 3 m from the

Table 1. Characteristics of subjects

	No FOF group median (interquartile range)	FOF group median (interquartile range)
Subject (week 1)	0	40
Subject (week 4)	20	20
Age (yr)	78.0 (73.0: 82.0)	80.0 (73.5: 85.5)
MMSE (score)	28.5 (26.0: 30.0)	29.0 (25.5: 30.0)
Height (cm)	152.0 (147.0:156.0)	148.0 (146.0:157.5)
Weight (kg)	45.5 (40.0: 52.0)	45.0 (39.5: 56.5)
BMI	20.4 (18.2: 22.9)	19.8 (18.2: 24.6)
prehospital FIM (score)	126.0 (125.0:126.0)	126.0 (124.5:126.0)

No FOF group: no fear of falling. FOF group: fear of falling. Mann-Whitney test *: $p<0.05$, **: $p<0.01$.

Table 2. Association between a history of falls and a fear of falling

		Fear of Falling		
		No FOF group	FOF group	total
History of Fall	First time	11	12	23
	Two times or more	9	8	17
	total	20	20	40

No FOF group: no fear of falling. FOF group: fear of falling. Fisher's exact probability test, p value=1.00.

start of path until the subject had passed the line 10 m ahead. The walking time was measured twice, and the fastest speed served as the walking time.

Knee extension strength on the affected side and unaffected side (denoted here as muscle strength on the unaffected side and the affected side) was measured in a bedside seated position with the arms crossed on the chest and the knee flexed at 90°. A hand-held dynamometer (Anima Corp. μtas F-1, an instrument to measure isometric muscle strength) was used to measure the maximum isometric contraction strength of both quadriceps, 2 times each. Maximum strength was the extension strength (Nm/kg) divided by the subject's weight.

Statistical analysis

Subjects with a fear of falling and subjects with no fear of falling were tested for normality using the Shapiro-Wilk test. This revealed a non-normal distribution, so the basic information from the 2 groups was compared using the Mann-Whitney test and χ^2 test (Fisher's exact probability test) to confirm that the groups were not biased. In addition, the Mann-Whitney test was used to ascertain differences between the 2 groups during each week (week 1, week 2, week 3 and week 4). Based on differences in the 2 groups of subjects during week 1 and week 4, an intragroup comparison was done using the Wilcoxon rank sum test to longitudinally confirm the data. Analysis was done using SPSS12.0J, and a level of significance of less than 5% was chosen.

RESULTS

Potential subjects were 93 patients with a fracture of the proximal femur who underwent surgery from March 2009–March 2010. Of these, 47 were excluded because they scored less than 24 points on the MMSE, they scored more than 24 points on the MMSE but were unable to understand the items being measured, or they were unable to walk unassisted or with a cane. Two subjects withdrew from the study and 4 could no longer participate because their condition worsened. Ultimately, 40 subjects were assessed. During week 1, all of the subjects had a fear of falling. Thus, subjects were dichotomized into individuals whose fear of falling remained (subjects with a fear of falling, n = 20) and individuals who had no fear of falling (subjects with no fear of falling, n = 20) after 4 weeks.

Differences in basic information from subjects with a fear of falling and subjects with no fear of falling were not noted during the initial assessment (Table 1). In addition, the results of the χ^2 test revealed no association between the number of falls and a fear of falling (p = 1.00) (Table 2).

Comparison of mental and physical function each week indicated that during week 1 there were no differences in the motor or psychological functions of either group. During weeks 2, 3 and 4, however, subjects with no fear of falling had significantly better ($p<0.05$) results in terms of the MFES and state anxiety than subjects with a fear of falling (Tables 3-1~3-4).

Comparison of the two groups of subjects during week 1 and week 4 revealed significant improvements ($p<0.01$) in subjects with a fear of falling in terms of the FIM, FRT, TUG, the 10mWT, muscle strength on the unaffected side and muscle strength on the affected side. Like the subjects with a fear of falling, subjects with no fear of falling showed significant improvement ($p<0.01$) in terms of the FIM, TUG, the 10-m walk, muscle strength on the unaffected side, and muscle strength on the affected side. However, only the subjects with no fear of falling had significant improvement ($p<0.05$) in the MFES from week 1 to week 4. Subjects with no fear of falling had a better median measure in the FRT than subjects with a fear of falling (21.5 cm for subjects with a fear of falling vs. 22.3

Table 3-1. Differences in mental and physical functions of subjects with a fear of falling and subjects with no fear of falling (week 1)

	No FOF group median (interquartile range)	FOF group median (interquartile range)
MFES (Score)	46.5 (15.8: 80.8)	44.0 (13.8: 74.0)
FIM (Score)	107.5 (103.3:112.8)	107.0 (97.3:110.0)
TUG (sec)	35.5 (22.9: 48.2)	44.5 (33.4: 66.4)
FRT (cm)	20.0 (14.4: 22.4)	19.0 (16.1: 24.8)
10mWT (Sec)	39.0 (26.2: 55.0)	44.7 (26.5: 82.0)
Unaffected side strength (Nm/kg)	2.2 (1.7: 2.7)	2.1 (1.9: 2.4)
Affected side strength (Nm/kg)	1.1 (0.8: 1.8)	1.0 (0.7: 1.3)
GDS (score)	5.0 (2.3: 8.8)	7.0 (2.3: 11.0)
TMT–A (sec)	195.4 (131.0:231.7)	198.5 (131.5:253.3)
State anxiety (Score)	43.5 (34.5: 48.8)	48.5 (40.3: 52.5)
Trait anxiety (Score)	41.0 (35.3: 53.0)	42.0 (34.0: 56.5)

No FOF group: no fear of falling. FOF group: fear of falling. Mann-Whitney test *: p<0.05, **: p<0.01.

Table 3-2. Differences in mental and physical functions of subjects with a fear of falling and subjects with no fear of falling (week 2)

	No FOF group median (interquartile range)	FOF group median (interquartile range)
MFES (Score)	73.0 (31.8:104.3)	40.5 (7.8: 66.8)*
FIM (Score)	117.5 (110.3:121.0)	114.0 (106.8:117.0)
TUG (sec)	24.0 (15.6: 32.8)	26.5 (20.7: 41.1)
FRT (cm)	22.8 (18.3: 25.9)	22.5 (16.3: 27.3)
10mWT (Sec)	20.2 (13.2: 28.1)	26.0 (18.3: 31.1)
Unaffected side strength (Nm/kg)	2.3 (1.9: 3.5)	2.3 (2.0: 2.8)
Affected side strength (Nm/kg)	1.3 (1.2: 2.1)	1.4 (1.2: 2.1)
GDS (score)	4.5 (3.0: 7.0)	7.0 (3.3: 11.5)
TMT–A (sec)	173.1 (121.1:230.5)	180.3 (120.2:230.8)
State anxiety (Score)	38.0 (29.5: 50.0)	51.5 (42.0: 58.8)**
Trait anxiety (Score)	41.5 (32.8: 48.8)	51.0 (37.8: 55.8)

No FOF group: no fear of falling. FOF group: fear of falling. Mann-Whitney test *: p<0.05, **: p<0.01.

Table 3-3. Differences in mental and physical functions of subjects with a fear of falling and subjects with no fear of falling (week 3)

	No FOF group median (interquartile range)	FOF group median (interquartile range)
MFES (Score)	74.5 (61.0: 95.5)	64.0 (9.8: 78.5)*
FIM (Score)	121.0 (117.5: 123.8)	120.0 (115.3: 121.8)
TUG (sec)	17.0 (13.0: 23.1)	21.6 (15.0: 29.5)
FRT (cm)	22.3 (16.6: 27.0)	23.0 (18.1: 27.3)
10mWT (Sec)	16.0 (12.1: 21.7)	20.2 (15.2: 22.8)
Unaffected side strength (Nm/kg)	2.4 (1.8: 3.5)	2.3 (2.0: 2.8)
Affected side strength (Nm/kg)	1.6 (1.4: 2.3)	1.7 (1.2: 2.1)
GDS (score)	3.5 (2.0: 7.5)	7.0 (3.0: 11.8)
TMT–A (sec)	148.3 (105.7: 195.5)	192.0 (132.5: 229.9)
State anxiety (score)	42.0 (33.5: 46.0)	48.0 (42.0: 54.0)*
Trait anxiety (score)	43.5 (33.3: 50.0)	46.0 (40.5: 56.0)

No FOF group: no fear of falling. FOF group: fear of falling. Mann-Whitney test *: p<0.05, **: p<0.01.

cm for subjects with no fear of falling), though the difference was not significant. (p = 0.053). Additionally, there was no significant improvement in GDS, TMT-A, or state and trait anxiety for either group of subjects from week 1 to week 4 (Table 4-1, Table 4-2).

DISCUSSION

Patients in the acute phase following a fall-related fracture are susceptible to a fear of falling. The current study examined the effects of a fear of falling on motor

Table 3-4. Differences in mental and physical functions of subjects with a fear of falling and subjects with no fear of falling (week 4)

	No FOF group median (interquartile range)	FOF group median (interquartile range)
MFES (score)	92.5 (62.5 :105.5)	57.0 (20.0 : 87.3)*
FIM (score)	123.0 (122.0 :125.8)	122.0 (118.5 :123.8)
TUG (sec)	16.0 (12.2 : 20.6)	18.1 (14.0 : 27.0)
FRT (cm)	22.3 (18.5 : 27.5)	21.5 (17.0 : 27.0)
10mWT (sec)	14.6 (11.2 : 18.3)	16.1 (13.3 : 21.3)
Unaffected side strength (Nm/kg)	2.6 (2.3 : 3.5)	2.5 (2.1 : 3.0)
Affected side strength (Nm/kg)	1.8 (1.6 : 2.2)	2.2 (1.7 : 2.4)
GDS (score)	3.5 (3.0 : 7.8)	8.0 (3.0 : 10.8)
TMT-A (sec)	148.1 (110.2 :210.4)	176.8 (136.3 :205.5)
State anxiety (score)	41.5 (32.5 : 48.0)	49.0 (44.0 : 53.8)**
Trait anxiety (score)	42.0 (31.3 : 54.5)	45.0 (43.0 : 54.0)

No FOF group: no fear of falling. FOF group: fear of falling Mann-Whitney test *: $p<0.05$, **: $p<0.01$.

Table 4-1. Differences between weeks 1 and 4 of subjects with a fear of falling

	Week 1 median (interquartile range)	Week 4 median (interquartile range)
MFES (score)	44.0 (13.8: 74.0)	57.0 (20.0: 87.3)
FIM (score)	107.0 (97.3:110.0)	122.0 (118.5:123.8)**
TUG (sec)	44.5 (33.4: 66.4)	18.1 (14.0: 27.0)**
FRT (cm)	19.0 (16.1: 24.8)	21.5 (17.0: 27.0)**
10mWT (sec)	44.7 (26.5: 82.0)	16.1 (13.3: 21.3)**
Unaffected side strength (Nm/kg)	2.1 (1.9: 2.4)	2.5 (2.1: 3.0)**
Affected side strength (Nm/kg)	1.0 (0.7: 1.3)	2.2 (1.7: 2.4)**
GDS (score)	7.0 (2.3: 11.0)	8.0 (3.0: 10.8)
TMT-A (sec)	198.5 (131.5:253.3)	176.8 (136.3:205.5)
State anxiety (score)	48.5 (40.3: 52.5)	49.0 (44.0: 53.8)
Trait anxiety (score)	42.0 (34.0: 56.5)	45.0 (43.0: 54.0)

Wilcoxon rank sum test *: $p<0.05$, **: $p<0.01$.

Table 4-2. Differences between weeks 1 and 4 of subjects with a no fear of falling

	Week 1 median (interquartile range)	Week 4 median (interquartile range)
MFES (score)	46.5 (15.8: 80.8)	92.5 (62.5:105.5)*
FIM (score)	107.5 (103.3:112.8)	123.0 (122.0:125.8)**
TUG (second)	35.5 (22.9: 48.2)	16.0 (12.2: 20.6)**
FRT (cm)	20.0 (14.4: 22.4)	22.3 (18.5: 27.5)
10mWT (sec)	39.0 (26.2: 55.0)	14.6 (11.2: 18.3)**
Unaffected side strength (Nm/kg)	2.2 (1.7: 2.7)	2.6 (2.3: 3.5)**
Affected side strength (Nm/kg)	1.1 (0.8: 1.8)	1.8 (1.6: 2.2)**
GDS (score)	5.0 (2.3: 8.8)	3.5 (3.0: 7.8)
TMT–A (second)	195.4 (131.0:231.7)	148.1 (110.2:210.4)
State anxiety (Score)	43.5 (34.5: 48.8)	41.5 (32.5: 48.0)
Trait anxiety (Score)	41.0 (35.3: 53.0)	42.0 (31.3: 54.5)

Wilcoxon rank sum test *: $p<0.05$, **: $p<0.01$.

function improvements in subjects with a fear of falling and subjects with no fear of falling. This study also cross-sectionally and longitudinally examined factors leading to the elimination of a fear of falling in terms of both motor and psychological functions.

With regard to the relationship between physical function and a fear of falling, a report[2] has indicated that having a fear of falling affects the effectiveness of rehabilitation, so disparities may arise in the extent of improvement as gauged by various indices. From week 1 to week 4, motor function as gauged by FIM, TUG, FRT, 10mWT, and muscle strength on the unaffected side and the affected side improved for both groups of subjects. During weeks 2, 3 and 4, there were no differences in the motor function of

subjects with a fear of falling and subjects with no fear of falling. The results reveal that motor function improved almost the same, regardless of whether or not subjects had a fear of falling. This is in contrast to a number of previous studies which stated that a high level of motor function was associated with a reduced fear of falling. Some previous studies have reported a close association between a fear of falling and ADL[4], that subjects with a fear of falling had significantly decreased knee extension strength compared to subjects with no fear of falling[6], and that ability to make postural corrections during tests like TUG and FRT, which indicate the levels of ambulatory ability and balance ability, is associated with a fear of falling[18,35]. However, other studies that have examined the association between a fear of falling and motor function[20,21,36] and intervention studies have found no differences in ambulation, balance or muscle strength among frail elderly who were divided into individuals with a fear of falling and individuals with no fear of falling. One study reported that there was no relationship between the fear of falling and physical function, and another reported that a reduced fear of falling was not noted for the most part despite improved ambulation. The results of the present study agree with the results of these studies. In other words, whether or not an individual has a fear of falling cannot be determined based on the level of motor function alone.

The current study tested psychological function in terms of depression, attentiveness and anxiety, which previous studies have indicated are associated with a fear of falling.

From week 1 to week 4, statistically significant improvements in GDS, TMT-A, and STAI were not noted. Moreover, there were no statistically significant differences in the GDS scores of subjects with no fear of falling and subjects with a fear of falling. The extent of depression may not be associated with loss of a fear of falling. However, differences between the 2 groups were noted, as indicated by a p value of 0.081 during Week 3. There is a possibility that significant differences would appear if the number of subjects were increased.

Attention was measured using the TMT-A. The TMT-A is administered at a desk in a short amount of time, so there is little burden on the patients. The test is thought to indicate the selective nature of attention[31]. However, many reports on the association between attention and a fear of falling used tests with a dual task and continued focused attention. One cited the need for control of higher cerebral function to shift attention[37]. In other words, measuring selective attention and unrequired attention, along with higher cerebral function in attention, may have led to results that differ from those of previous studies.

Anxiety was measured using the STAI. This instrument allows measurement of both state anxiety, which indicates a subject's current level of anxiety, and trait anxiety, which indicates a subject's susceptibility to anxiety. Significant improvement in state anxiety was not noted from week 1 to week 4, but subjects with no fear of falling were noted to have slightly reduced anxiety. Cross-sectionally, subjects with no fear of falling had significantly less anxiety during weeks 2, 3, and 4 than subjects with a fear of falling. The STAI measures anxieties not specified by the subject, which include fear, and various factors besides the fear of falling may have affected the results. Alleviation of anxiety that led to "a fear of falling" may also have had a slight effect. Comparison of week 1 and week 4 and comparisons of weeks 2, 3 and 4 revealed no differences in trait anxiety. Kondo et al.[3] studied trait anxiety alone and reported that the fear of falling and trait anxiety were not associated. The present study similarly found that trait anxiety was not associated with the fear of falling. However, trait anxiety is an individual characteristic that indicates a subject's susceptibility to anxiety. Anxiety was also tested in this study using the state anxiety scale, which indicates a subject's current anxieties.

Based on the results of the present study, improved motor function can be expected during hospitalization even when the individual has a fear of falling. Conversely, these results may corroborate the view that intervention in motor function alone will not eliminate the fear of falling. In other words, motor function does not determine whether or not an individual will have a fear of falling. Assuming that an individual has a high level of motor function, the individual's confidence in physical actions will increase. Some form of cognitive modification that increases confidence and reduces anxiety may eliminate the fear of falling.

Thus, the fact that improved motor function is not directly related to elimination of a fear of falling touches upon the theory of self-efficacy. A proponent of self-efficacy, Bandura[38], theorized that "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations" would increase one's self-efficacy. In addition, accumulating experience successfully carrying out courses of action is crucial to increasing self-efficacy[39]. In other words, having or lacking a fear of falling may change depending on whether the subject is cognizant of his or her capabilities to organize and execute courses of action at the subject's level of motor function, regardless of the status of motor function. The present study noted a divergence between patients with increased self-efficacy and patients with the same level of self-efficacy despite similar levels of physical functions. Gaining experience successfully carrying out courses of action and accumulating such experiences are a way of increasing self-efficacy. The quantity of ADL exercises performed during rehabilitation and the extent and frequency of ADL "performed" by the individual while on the ward may play a role in the individual's cognizance of his or her capabilities to organize and execute courses of action and may be a way of increasing fall efficacy for that individual. Such issues are topics for future study.

Advances in surgical procedures now allowed the performance of weight-bearing exercises soon after surgery for a fracture of the proximal femur. Thus, goals of rehabilitation are early ambulation and discharge. In patients with a fracture of the proximal femur, a fear of falling has more of a negative effect on the improvement of physical function than the presence or absence of depressive symptoms or pain[2]. The results of the presence study suggest that a fear of falling will not develop into a factor that inhibits improved physical function if the individual is

hospitalized for a short period of time.

One limitation of this study is that it did not examine the qualitative aspects of subjects, i.e. what subjects were thinking and how that thinking changed prior to the disappearance of their fear of falling. Thus, this study did not clarify in detail why self-efficacy increased and fear of falling was lost in only some of the subjects. A second limitation of this study was its limited scope. This study only covered patients hospitalized after a fall-related fracture and it covered a short period of time, 4 weeks, so the presence factors and other aspects must be studied over a longer period of time.

The presence study offers several suggestions for future study. The results suggest that self-efficacy must be increased to eliminate the fear of falling. Thus, topics for future study are clarification of ways to effectively improve fall efficacy and exploration of ways to improve motor function through rehabilitation and forms of intervention to eliminate the fear of falling.

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