

The “Meaningful Occupations” and Self-Restrain Activities Due to the Fear of Falling Among Community-Dwelling Older Adults in Japan

The “Meaningful Occupations” and Self-Restrain Activities Due to the Fear of Falling

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Abstract : The purposes of this study are 1) to clarify the structural factors of “meaningful occupation” to make the concept of a new support service by qualitative analysis (n=19; mean age 84.1±5.5); 2) to analyze the relation among the restraint by oneself of activities in daily living and the physical, cognitive, psychological function and social participations by the questionnaire survey regarding fall (n=135; mean age 75.9 ± 5.9). In the first research, we investigated the important activities for older women by a semi-structured interview that was analyzed by text mining software. It was divided into two categories; the activity inside home and the activity outside home. By the network analysis, it showed that the positive words (i.e. “good”, “can do”) were concerned with words which were related with the relationships around the older adults suggesting that positive factors of “meaningful occupation” were connected to human relations. In the second research, 37% of subjects reported self-restraint activities related to mobility. Our findings showed that those who fell more than once limit their own activities in comparison with who fell once a year. The social aspects must be addressed when treating older population and those important activities for elders must not be restrained by fall.

Key words : Basic Checklist, Self-restraint activities, Text mining, Qualitative study, Occupational therapy

INTRODUCTION

The public awareness to the role of falls as one of the leading causes of death among the older

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population has been increased^{1,2)}. Despite the direct consequences of falls, for example fractures, there also side effects such as the increase of the fear of falling that is the most commonly reported anxiety among elders and can potentially be a trigger to a variety of behavioral changes, including changes in motor pattern, avoidance of feared activities and environments, and arising medication use that may adversely affect their lives³⁻⁷⁾. Evidences showed that the fear of falling is associated with worse health and balance, lower mobility and activity levels, higher levels of psychological distress, and poorer quality of life^{1,6,8-11)}. In this article we will address the activity restraint as one of the major alarming consequences of fear of falling considering that it can reduce health and compromise quality of life.

The concept of quality of life (QOL) is multidimensional and includes physical, psychological, social, environmental, and spiritual dimensions¹²⁻¹⁴⁾.

Table 1. Subjects characteristics – Research 1 (n=19)

	Mean $\pm$ SD	Range	n (%)
Age	84.1 $\pm$ 5.5	77-96	
Living arrangement			
Alone in the community			7 (36.8)
Alone in the nursing home			12 (63.2)
Occupation			
Formal work			1 (5.3)
Informal work			7 (36.8)
Retired			11 (57.9)
Medical information			
Outpatient			17 (89.5)
No hospitalization			2 (10.5)
Fall history (past 1 year)			
Faller			3 (15.8)
Non-faller			16 (84.2)
BC-JMHLW ^{a)}			
Total score	6.9 $\pm$ 3.3	1-13	
Musculoskeletal score	1.8 $\pm$ 0.9	0-3	
MMSE ^{b)}	27.5 $\pm$ 2.1	23-30	
FIM ^{c)}	122.2 $\pm$ 4.2	111-126	

a) Basic Checklist by Japanese Ministry of Health, Labour and Welfare

b) Mini-mental state examination

c) Functional Independence Measure

Besides the comprehension of the QOL aspects, it is also important to weigh those factors and to determine which are of greatest importance to the older adults to make decisions and to address the caring for aged population.

In the last 10 years after the Long Term Care Insurance system was conducted in Japan, new support service concepts according to the individual needs of the older person are required.

Therefore, the purpose of this study are 1) to clarify the structural factors to make the concept of a new support service by qualitative analysis; 2) to analyze the relation among the restraint by oneself of activities in daily living and the physical, cognitive, psychological function and social participations by the questionnaire survey regarding fall.

METHODOLOGY

This article describes two independent researches. The first one investigated the activities that were important for the QOL among older women; and the second study verified which activities the older adults avoided to do due to the fear of falling.

1. Research 1

The first research was a qualitative study. The participants were 19 community-dwelling older women in Japan (Table 1). The inclusion criteria of the subjects were those who were apparently physical and

cognitive healthy and independent in daily living activities. The exclusion criteria were the participants of the Long Term Care Insurance whose need care level 3 or higher, and those who scored less than 23 points in the MMSE. Research 1 is a qualitative study; therefore the sample size cannot be clearly defined¹⁵⁾, so we determined the amount of 19 subjects to participate in this study.

The assessments comprehended a semi-structured interview that was performed according to the interview guide: (1) Which activities are important in your daily routine? (2) Why do you perform these activities? (3) Why these activities are important for you? Please explain the meaning of the importance of those activities. (4) Since when and how those activities become important for you? One interview session lasted about 30 to 60 minutes. The whole interview was recorded, and converted the dialog into text format. Then it was analyzed by the text mining software, a Japanese-language morphologic analysis (KH Coder, <http://khc.sourceforge.net/>). Text mining is a useful technique to obtain information such as the subjects' thoughts about life and real intention, contained in the language data. Moreover it provides the possibility to treat the qualitative data as quantitative data with the advantage as avoiding an arbitrary interpretation¹⁶⁾. KH Coder used in present study has been established as a quantitative analysis¹⁷⁾ and it has been widely used

by researchers in several fields. By the software we extracted the words which were used with higher frequency in an interview session and then it constructs networks among the “co-occurrence relation” that consists of two words that appeared at the same time in one sentence.

2. Research 2

The subjects of the second study there were 135 healthy older adults aged 65years or older (mean age 75.9 ± 5.9 years; 72.6% female) (Table 2). The subjects were community-dwelling older adults and independent in daily living activities. They were recruited in exercise classes offered by the Community General Support Center. In order to analyze the data using multivariate analysis, we calculated a required sample size as 100 subjects or more.

Aiming to investigate the activity restraint due to the

fear of falling a battery of questionnaires was performed (87.6% response rate). The assessments were described in Table 3. We have carried out a comparison of the average value between the genders by t-test for each evaluation item. Additionally, we divided the subjects into three groups according to the number of falls, and performed multiple comparisons between the three groups for each evaluation item using Steel-Dwass.

RESULTS

The important activities for the QOL were divided into two categories; the activity inside home and the activity outside home. The activities inside home included talking, having a meal, dressmaking, praying, doing morning custom, knitting, reading books/newspaper, watching TV, and writing haiku (Japanese

Table 2. Subjects characteristics – Research 2 (n=135)

Variables	Mean $\pm$ SD	n (%)
Age	75.9 ± 5.9	
BMI ^{a)} (kg/m ²)	22.2 ± 2.7	
Fall history (past 1 year)		
Non		95 (70.4)
Once		27 (20.0)
Twice or more		13 (9.6)
BCJ-MHLW ^{b)}		
Total score (/25)	5.2 ± 4.0	
Musculoskeletal score (/5)	1.8 ± 1.5	
Fear of falling		75 (56.4)
TMIC-IC ^{c)} (/13)	12.0 ± 1.6	
IADL d) (/14)		
Number of enrolled activities	11.3 ± 2.2	
Number of important activities	11.4 ± 2.3	
Number of self-restrain activities	1.0 ± 2.3	
Number of subjects restrain one or more activities		50 (37.1)
Self-rated health		
Very healthy		20 (16.1)
Healthy		79 (63.7)
Not so healthy		22 (17.7)
Unhealthy		2 (1.6)
Life satisfaction		
Very satisfied		8 (6.3)
Satisfied		98 (78.6)
Not so satisfied		20 (15.6)
Unsatisfied		2 (1.6)
Does your life have purpose?		
Yes, many purpose		34 (30.0)
Yes, some purpose		44 (33.6)
Yes, a few purpose		52 (39.7)
No		

a) Body Mass Index

b) Basic Checklist by Japanese Ministry of Health, Labour and Welfare

c) Tokyo Metropolitan Institute of Gerontology Index of Competence

d) Instrumental Activities of Daily Living

Table 3. Assessments – Research 2

Topics	Items
Socio demographic information	Age Gender Height Weight
Functional level	Basic Checklist by Japanese Ministry of Health, Labour and Welfare: an index of frailty (BC-JMHLW) Tokyo Metropolitan Institute of Gerontology Index of Competence (TMIG-IC)
History of falls in the past year	Number of falls
IADL items	14 IADL (frequency, importance, self-restrain)
Quality of life	Self-rated health Life satisfaction Life purpose

poem). The network was constructed by 17 words that appeared more than 10 times in the interviews. The analysis showed by the network that the word “good” was connected with the words “being able to do”, “be continuing”, and “acquaintances” (Figure 1).

Regarding the activities outside home were mini golf, chorus, water exercise, going to hospital/ rehabilitation, learning PC/ceramic art, gardening, shopping, going out, going to a department store. The network was constructed by 14 words that appeared more than 8 times in the interviews. Concerning these activities, the analysis showed by the network that the word “good” was connected with the words “being able to do”, “going out to do something”, and “friends” (Figure 2).

In the second study, the majority of the subjects did not experience the fall event in the past year ($n=95$, 70.4%), while 27 older adults fallen once in the same period (20.0%), and 13 subjects experienced the fall event twice or more in the past year (9.6%). A total amount of 50 subjects (37.0%) responded that they have restraint to do the IADL activities due to the fear of falling (Table 2). The activities that the subjects showed more restraint to perform was to ride a bicycle (32.3%); followed by going out by bus or train (11.8%), watching television or reading newspapers (10.7%), go shopping (9.2%), and house safety management (8.6%) (Table 4).

There was no significant difference regarding the age ($p=0.85$), musculoskeletal score of BC-JMHLW and fear of falling were significantly higher in women than

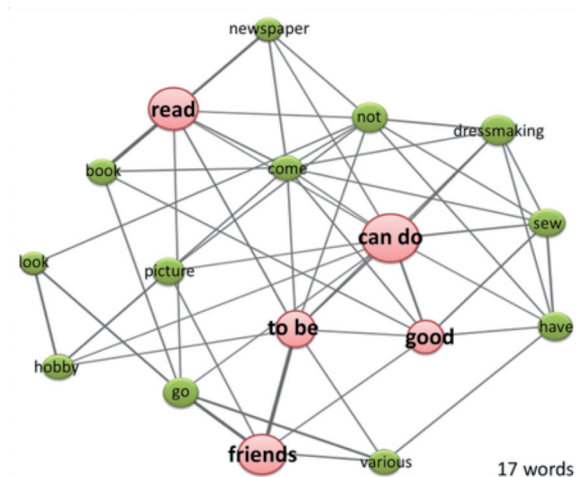
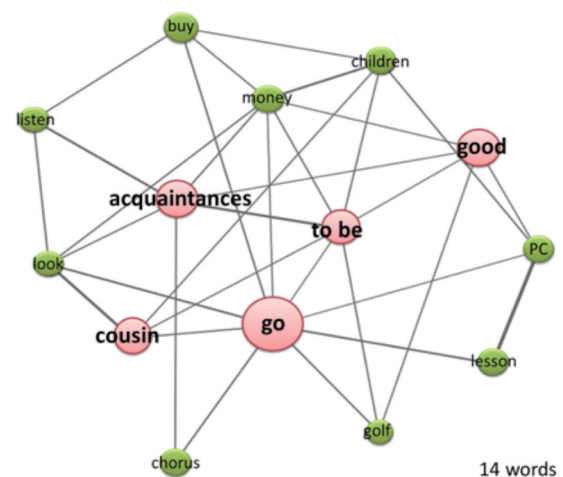
**Figure 1.** The network of the activities inside home – Research 1**Figure 2.** The network of the activities outside home – Research 1

Table 4. IADL – Research 2

	Engagement	Importance	Self-restrain
	n (%)	n (%)	n (%)
Interacting with friends or family	128 (98.5)	129 (98.5)	5 (4.1)
Watching TV- Reading newspaper	128 (99.2)	126 (94.7)	13 (10.7)
House safety management	124 (96.9)	125 (99.2)	10 (8.6)
Using telephone	123 (96.1)	121 (91.7)	8 (6.7)
Bank account management	122 (96.1)	121 (97.6)	7 (6.0)
Shopping	121 (96.0)	123 (96.9)	11 (9.2)
Managing medicine	120 (95.2)	119 (95.2)	6 (5.2)
Preparing for the meal / Cleaning	117 (90.0)	122 (94.6)	9 (7.6)
Preparing to go out	114 (92.7)	120 (92.3)	10 (8.2)
Laundry	111 (89.5)	114 (91.9)	7 (5.9)
Cooking	107 (85.6)	115 (93.5)	6 (5.0)
Going out by bus or train	97 (77.0)	99 (85.3)	13 (11.8)
Riding a bicycle	61 (48.0)	59 (55.1)	32 (32.3)
Driving a car	46 (36.5)	47 (59.5)	3 (4.4)

men in the comparison between genders ($p<0.05$).

We compared the differences among the 3 groups (non-fallers; fallers-once time; fallers-twice or more times) (Table 5). The group that experienced the fall event two times or more had a significantly higher number of self-restraint activities in comparison with those group that experience the fall event once ($p<0.05$). There was no significant difference regarding the number of self-restraint activities between the group without falling and the group that reported once fall event (Figure 3). The group of fallers (twice

or more) had a significantly higher score in the BC-JMHLW ($p<0.01$); and the fallers group (once or twice or more fall events) had a significantly higher score in the musculoskeletal domain in the BC-JMHLW in comparison with the group without falling ($p<0.01$) (Figure 4-a; 4-b).

DISCUSSION

According to the words networks (Figure 1, 2), positive words (i.e. “good”, “can do”) were concerned with the words which were related with the relationships around the older adults (i.e. “friends”, “acquaintances”). Our results showed that the positive factors of “meaningful occupation” were connected to human relations. Other study reported that receiving and providing social support had positive effects on health. Even in the absence of older people¹⁸⁾. We had reported five factors of the important activity, such as “relationships” for older women in hilly and mountainous area in Japan¹⁹⁾. Social supports and social relationships with others must be important for community-based rehabilitations for older adults living alone and independently. Our findings were consistent with other study that asked 2,000 randomly selected participants to identify and rank the most important QOL aspects and the most highly ranked was relationships with family, followed by their own health, health of a close person, and finances standard of living/housing²⁰⁾.

Addressing the results of the second research, 29.6%

Table 5. The group's multiple comparisons between the three groups by fall history – Research 2

	Non-faller	Faller (once)	Faller (twice or more)	p-value ^{a)}		
	Mean (SD)	Mean (SD)	Mean (SD)	non vs. once	non vs. twice	once vs. twice
Age	75.3(5.8)	77.0(5.7)	77.9(6.8)	n.s.	n.s.	n.s.
BMI	22.2(2.8)	22.0(2.4)	22.6(2.5)	n.s.	n.s.	n.s.
Total score of BC-JMHLW	4.4(3.4)	6.3(3.9)	9.1(5.4)	n.s.	$p<0.01^{**}$	n.s.
Musculoskeletal score of BC-JMHLW	1.3(1.3)	2.6(1.5)	3.3(1.3)	$p<0.01^{**}$	$p<0.01^{**}$	n.s.
Fear of falling	0.5(0.5)	0.6(0.5)	0.9(0.3)	n.s.	$p<0.05^{*}$	n.s.
TMIG-IC	12.3(1.1)	12.1(1.2)	9.8(3.2)	n.s.	$p<0.01^{**}$	$p<0.05^{*}$
Number of enrolled activities	11.3(2.3)	11.7(1.3)	10.1(2.8)	n.s.	n.s.	n.s.
Number of important activities	11.4(2.3)	11.9(2.1)	10.8(2.6)	n.s.	n.s.	n.s.
Number of self- restrain activities	0.9(1.9)	0.6(1.6)	3.0(4.4)	n.s.	n.s.	$p<0.05^{*}$
Self-rated health	1.9(0.6)	2.3(0.6)	2.3(1.0)	$p<0.05^{*}$	n.s.	n.s.
Life satisfaction	2.1(0.4)	2.3(0.6)	2.2(0.7)	n.s.	n.s.	n.s.
Life purpose	2.1(0.8)	2.3(0.9)	2.4(0.7)	n.s.	n.s.	n.s.

a) Steel-Dwass

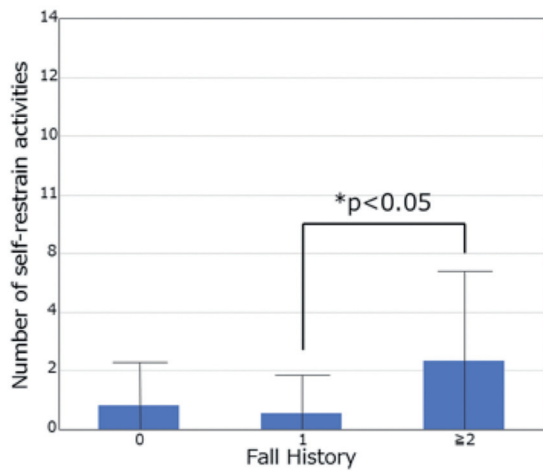


Figure 3. The group's multiple comparisons of the number of self-restrain activities – Research 2

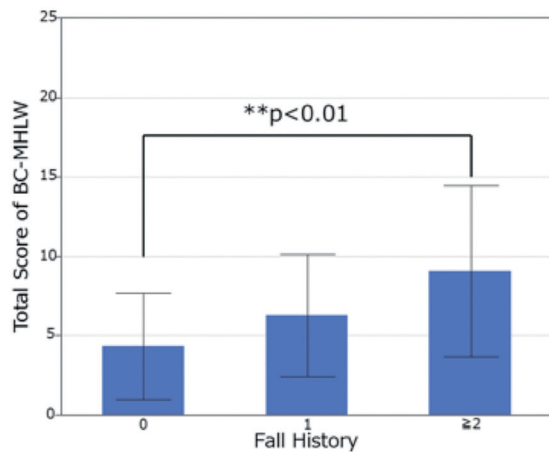


Figure 4-a. The group's multiple comparisons of the total score of BC-JMHLW – Research 2

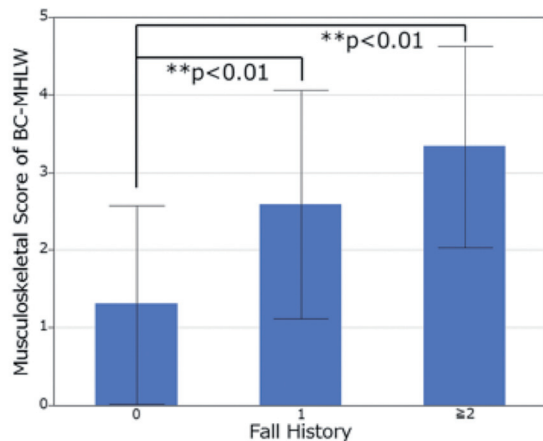


Figure 4-b. The group's multiple comparisons of the musculoskeletal score of BC-JMHLW – Research 2

of the older adults reported falling in the past year, and 37.0% of the subjects restrained the activities related to mobility (to go out riding a bicycle, by train or bus, go shopping). Our findings showed that those who fell more than once have a stronger fear of falling and limit their own activities related to movement and these findings were consistent with previous studies that reported limitation of activity due to fear of falling, and occur as strong as many number of falls for one year 3). Additionally, studies found a correlation of the fear of falling and the decline of activities of daily living²¹⁻²⁵).

Those who fell at least once a year, had a higher score in total score of BC-JMHLW and also in the musculoskeletal score of BC-JMHLW is an index to predict the risk into care also required.

It is necessary to underline that the fear of falling is not solely determined by physical vulnerability and also that this anxiety is not uncommon among those who have never fallen^{9, 26}). The fear of falling is a complex health issue and it is necessary to deep the investigation regarding the relation between the fear of falling and restraint of activity and how it affects the overall QOL in the future.

In Research 1, due to the limited number of women aged 65 years or older, we encourage future researches with a higher sample size, including men, and with a different background factors. In addition, in the present study, we didn't investigate any negative aspects regarding the meaningful activities; therefore it should be comprehended in further studies. In Research 2, in order to clarify the relationship between the sense of fear of falling and meaningful activities for the older adults, a large-scale survey has been conducted.

CONCLUSION

Our study suggests that the positive factors of “meaningful occupation” are those that the older women can do and continue to do it with their friends/acquaintances. Our study also concluded that the activities with higher self-restrain were those related to mobility. The findings showed that those who fell more than once limit their own activities in comparison with who fell once a year. The social aspects must be addressed when treating older population and those important activities for elders must not be restrained by fall. In addition, a rehabilitation intervention must be addressed for those who experienced a fall event twice or more per year.

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REFERENCES

- 1) Lachman ME, Howland J, Tennstedt S, Jette A, Assmann S, Peterson EW: Fear of Falling and Activity Restriction: The Survey of Activities and Fear of Falling in the Elderly (SAFE). *Journal of Gerontology*, 1998 ; 53B (1) : 43-50
- 2) Hazzard WR, Blass JP, Ettinger WH, Halter JB, Ouslander JG: *Principles of Geriatric Medicine and Gerontology*. New York : McGraw-Hill, 1998 : 1387-1402
- 3) Yardley L, Smith H: A Prospective Study of the Relationship Between Feared Consequences of Falling and Avoidance of Activity in Community-Living Older People. *The Gerontologist*, 2002 ; 42 : 17-23
- 4) Howland J, Peterson EW, Levin WC, Fried L, Pordon D, Bak S: Fear of falling among the community-dwelling elderly. *Journal of Aging and Health*, 1993 ; 5 : 229-243
- 5) Maki BE: Gait changes in older adults: Predictors of falls or indicators of fear? *Journal of the American Geriatric Society*, 1997 ; 45 : 313-320
- 6) Vellas BJ, Wayne SJ, Romero LJ, Baumgartner RN, Garry PJ: Fear of falling and restriction of mobility in elderly fallers. *Age and Aging*, 1997 ; 26 : 189-193
- 7) Yardley L: Fear of imbalance and falling. *Reviews in Clinical Gerontology*, 1998 ; 8 : 23-29
- 8) Afken CL, Lach HW, Birge SJ, Miller JP: The prevalence and correlates of fear of falling in elderly persons living in the community. *American Journal of Public Health*, 1994 ; 84 : 565-570
- 9) Chandler JM, Duncan PW, Sanders L, Studenski S: The fear of falling syndrome: Relationship to falls, physical performance and activities of daily living in frail older persons. *Topics in Geriatric Rehabilitation*, 1996 ; 11 : 55-63
- 10) Liddle J, Gilleard C: The emotional consequences of falls for older people and their families. *Clinical Rehabilitation*, 1995 ; 9 : 110-114
- 11) Tinetti ME, Mendes de Leon CF, Doucette JT, Baker DI: Fear of falling and fall-related efficacy in relationship to functioning among community-living elders. *Journal of Gerontology*, 1994 ; 49 : 140-147
- 12) Fallowfield L: *Quality of life. The missing measurement in health care*. London : Souvenir Press, 1990 : 11-24
- 13) WHOQOL Group: The World Health Organization Quality of Life assessment (WHOQOL): Position paper from the World Health Organization. *Social Science and Medicine*, 1995 ; 41 : 1403-1409
- 14) WHOQOL-SRPB Group: A cross-cultural study of spirituality, religion and personal beliefs as components of quality of life. *Social Science and Medicine*, 2006 ; 62 : 1486-1497
- 15) Flick U: *Qualitative Forschung*. Tokyo: Syunzyu-Sya, 2008: 78-92 (in Japanese)
- 16) Hatoma A, Kodama K, Tamura S: The Evaluation Criteria Used by Caregivers and the Dimensions of the Degree of Caring in Relation to the Effect of House Remodeling on the Elderly – Analysis of Open-ended Questions by Text Mining -. *Japanese Journal of Social Welfare*, 2004 ; 45 (2): 67-80
- 17) Higuchi K: Quantitative Analysis of Textual Data: Differentiation and coordination of Two Approaches. *Sociological Theory and Methods*, 2004 ; 19 (1): 101-115
- 18) Murata C, Saito Y, Kondo K, Hirai H: Social support and depression among community living older people – AGES Project-. *Japanese Journal of Gerontology*, 2011 ; 33 : 15-22
- 19) Futaki T, Shirai H, Sakamoto K, Miyamoto H, Sawada K: Analysis of ADL needs of the elderly people relating to prevention of a fall. *Japanese Occupational Therapy Research Supplement*, 2010 ; 44: P0302
- 20) Bowling A: What things are important in people's lives? A Survey of the public's judgments to inform scales of health related quality of life. *Social Science and Medicine*, 1995 ; 41 : 1447-1462
- 21) Hill KD, Schwarz JA, Kalogeropoulos AJ, Gibson SJ: Fear of falling revisited. *Archives of Physical and Medical Rehabilitation*, 1996 ; 77 : 1025-1029
- 22) Mendes re Leon CF, Seeman TE, Baker DI, Richardson ED, Tinetti ME: Self-efficacy, physical decline, and change in functioning in community-living elders: A prospective study. *Journal of Gerontology*, 1996 ; 51B : 5183-5190
- 23) Myers AM, Powell LE, Maki BE, Holliday PJ, Brawley LR, Sherk W: Psychological indicators of balance confidence: Relationship to actual and perceived abilities. *Journal of Gerontology*, 1996 ; 51A : 37-43
- 24) Tinetti ME, Richman D, Powell L: Falls efficacy as a measure of fear of falling. *Journal of Gerontology* 1990 ; 45 : 239-243
- 25) Tinetti ME, Mendes de Leon CF, Doucette JT, Baker DI: Fear of falling and fall-related efficacy in relationship to functioning among community- living elders. *Journal of Gerontology*, 1994 ; 49 : 140-147
- 26) Liddle J, Gilleard C: The emotional consequences of falls for older people and their families. *Clinical Rehabilitation*, 1995 ; 9 : 110-114