

Correlational Study between Flexibility, Annual Falls, and Quality of Life in the Elderly



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Introduction

The relentless pass of time brings about the aging process all humans endure. This progression is often characterized by reduced physical activity precipitating decreased physical flexibility and mobility. These degenerative changes often beget an increased falling risk (Hindmarsh & Estes, 1989).

Aging is associated with muscle weakness due to a reduction in muscle mass (Baroni et al., 2013). All aging beyond adolescence is accompanied by an increase in intramuscular connective tissue proliferation, stiffness, and decreased range of motion. When physical activity in the elderly wanes, flexibility and functional capacity suffers. This physical instability contributes to a heightened fear of falling (de Oliveira, Pires-Oliveira, Abucarub, Oliveira, & de Oliveira, 2016).

Incidentally, falls are the sixth cause of death in adults over 65 years of age (Baraff, Della Penna, Williams, & Sanders, 1997). The causes of these falls are multifaceted; however, research shows the greatest contribution to falling incidence is balance deficit. In an effort to reduce falls in seniors, studies demonstrate that programs targeting balance improvement are proven to be most productive in decreasing fall incidence (Rikli & Jones, 2001; Sherrington et al., 2008). Some studies have suggested that the risk or fear of falling and reduced physical activity negatively affect the quality of life of the elderly (Kendrick et al., 2014). The present study investigated the contribution of upper and lower body flexibility to annual falls and quality of life (QOL) in the elderly.

Methods

Participants

Upon IRB approval, ninety independently living subjects (16 men and 74 women) 65 years of age and older, with verbal and written communication capacity, were recruited for the study. Participation was entirely voluntary and only fully completed questionnaires and measurements for individual subjects were utilized in analysis. The final sample consisted of 81 subjects (14 men and 67 women).

Surveys and Instruments:

The PROMIS-29 v 2.0 short form Examines the following areas of functioning: Physical, Anxiety, Depression, Fatigue, Sleep Disturbance, Ability to Participate in Social Roles, and Pain Interference.

Upper and lower body flexibility were assessed utilizing the senior fitness tests of the back scratch test and chair sit-and-reach test respectively developed by Rikli and Jones. The measurements were subsequently translated into percentile ranking scores utilizing the subject's sex, age, and flexibility measurement compared to normalized tables developed by Rikli and Jones (Rikli & Jones, 2001).

Statistical Analysis

The statistical analysis was conducted utilizing the IBM SPSS Statistics Version 24. Relationships between flexibility, quality of life components, and annual falls were explored via Pearson correlation analysis for the entire sample. Multiple linear regression analyses predicted the contribution of flexibility and physical activity to the prediction of Quality of Life or Annual Falls.

Demographic Characteristics of the Sample

The final sample consisted primarily of elder Caucasian females in good health and physically active, living independently, and that experienced few falls in the last year.

Demographic Characteristics of the Sample			
Variable	Distribution (%)	Variable	Distribution (%)
Age	65-75 years	Ethnicity	Caucasian
	76-91 years		American Indian/Alaska Native
Annual Falls	Falls	BMI	16-27
	No Falls		27-48
Gender	Male	Frequency of Weekly Exercise	Zero
	Female		1-2
Marital Status	Married	3-4	3-4
	Divorced	4-5	4-5
	Separated	>5	>5
	Widowed		

Results

Correlation between Annual Falls, Demographic, Physical Activity, Flexibility, and Quality of Life Variables

As expected, upper and lower body flexibility were highly correlated. Similarly, participants with higher BMI reported being more fatigued, and older individuals displayed lower physical functioning. Participants that experienced less annual falls, exercised more times per week, had better lower back flexibility, and better quality of life.

Higher lower body flexibility was associated with less depression, fatigue, sleep disturbance, and pain interference, and with more active social roles. On the other hand, higher upper body flexibility was related to lower BMI, and better social functioning

Variables	Annual Falls	Flexibility		Quality of Life							
		Lower body flexibility	Upper body flexibility	Physical Functioning	Anxiety	Depression	Fatigue	Sleep Disturbance	Social Role	Pain Interference	Pain Rating
Annual Falls	—	-.36 ^{pc.001}	-.35 ^{pc.005}	-.44 ^{pc.000}	-.54 ^{pc.000}	-.54 ^{pc.000}	-.38 ^{pc.001}	-.32 ^{pc.003}	-.35 ^{pc.001}	-.32 ^{pc.003}	-.44 ^{pc.000}
Demographic											
Age	.08 ^{pc.05}	.02 ^{pc.05}	.05 ^{pc.05}	-.09 ^{pc.007}	.06 ^{pc.05}	.11 ^{pc.05}	.17 ^{pc.05}	.11 ^{pc.05}	.02 ^{pc.05}	.11 ^{pc.05}	.10 ^{pc.05}
Gender	-.02 ^{pc.05}	-.05 ^{pc.05}	-.10 ^{pc.05}	-.12 ^{pc.05}	.15 ^{pc.05}	.14 ^{pc.05}	.10 ^{pc.05}	-.06 ^{pc.05}	-.10 ^{pc.05}	.15 ^{pc.05}	.17 ^{pc.05}
Marital status	-.03 ^{pc.05}	.01 ^{pc.05}	-.01 ^{pc.05}	-.02 ^{pc.05}	.06 ^{pc.05}	-.11 ^{pc.05}	.02 ^{pc.05}	-.01 ^{pc.05}	.07 ^{pc.05}	-.02 ^{pc.05}	.01 ^{pc.05}
BMI	-.01 ^{pc.05}	-.002 ^{pc.05}	-.03 ^{pc.05}	-.14 ^{pc.05}	-.09 ^{pc.05}	-.10 ^{pc.05}	-.04 ^{pc.05}	-.04 ^{pc.05}	-.08 ^{pc.05}	-.18 ^{pc.05}	.01 ^{pc.05}
Physical activity											
Weekly exercise	-.23 ^{pc.003}	.17 ^{pc.05}	.01 ^{pc.05}	-.09 ^{pc.005}	-.10 ^{pc.05}	-.11 ^{pc.05}	-.11 ^{pc.05}	-.21 ^{pc.004}	.16 ^{pc.05}	-.13 ^{pc.05}	-.11 ^{pc.05}
Type of exercise practice	-.05 ^{pc.05}	.11 ^{pc.05}	.07 ^{pc.05}	.09 ^{pc.05}	-.04 ^{pc.05}	-.11 ^{pc.05}	-.11 ^{pc.05}	-.17 ^{pc.05}	.09 ^{pc.05}	-.03 ^{pc.05}	.02 ^{pc.05}
Flexibility											
Lower body flexibility	-.36 ^{pc.001}	—	.45 ^{pc.000}	-.18 ^{pc.05}	-.15 ^{pc.05}	-.25 ^{pc.002}	-.22 ^{pc.004}	-.25 ^{pc.002}	.21 ^{pc.05}	-.21 ^{pc.004}	-.10 ^{pc.05}
Upper body flexibility	-.16 ^{pc.05}	.45 ^{pc.000}	—	.45 ^{pc.001}	-.07 ^{pc.05}	-.11 ^{pc.05}	-.03 ^{pc.05}	.18 ^{pc.05}	.21 ^{pc.05}	-.18 ^{pc.05}	-.18 ^{pc.05}
Quality of Life											
Physical Functioning	-.44 ^{pc.000}	-.18 ^{pc.05}	.15 ^{pc.05}	—	-.41 ^{pc.000}	-.38 ^{pc.004}	-.38 ^{pc.000}	-.35 ^{pc.001}	-.42 ^{pc.000}	-.40 ^{pc.000}	-.59 ^{pc.000}
Anxiety	.44 ^{pc.000}	-.18 ^{pc.05}	-.07 ^{pc.05}	-.41 ^{pc.000}	—	.46 ^{pc.000}	.72 ^{pc.000}	.23 ^{pc.003}	-.18 ^{pc.000}	.68 ^{pc.000}	.37 ^{pc.000}
Depression	.44 ^{pc.000}	-.18 ^{pc.05}	-.01 ^{pc.05}	-.32 ^{pc.004}	.46 ^{pc.000}	—	.64 ^{pc.000}	.36 ^{pc.000}	-.09 ^{pc.000}	.49 ^{pc.000}	.33 ^{pc.000}
Fatigue	.38 ^{pc.001}	-.02 ^{pc.04}	-.13 ^{pc.05}	-.08 ^{pc.004}	.72 ^{pc.000}	.62 ^{pc.000}	—	.31 ^{pc.004}	-.04 ^{pc.000}	.45 ^{pc.000}	.32 ^{pc.000}
Sleep Disturbance	.33 ^{pc.003}	-.15 ^{pc.002}	.18 ^{pc.05}	-.33 ^{pc.001}	.23 ^{pc.003}	.10 ^{pc.05}	.31 ^{pc.004}	—	.20 ^{pc.005}	.45 ^{pc.000}	.22 ^{pc.003}
Social Role	-.35 ^{pc.003}	.21 ^{pc.05}	.21 ^{pc.05}	.43 ^{pc.000}	-.08 ^{pc.000}	-.06 ^{pc.000}	-.03 ^{pc.000}	-.20 ^{pc.005}	—	.62 ^{pc.000}	.41 ^{pc.000}
Pain Interference	-.35 ^{pc.003}	.21 ^{pc.05}	.21 ^{pc.05}	.43 ^{pc.000}	-.08 ^{pc.000}	-.06 ^{pc.000}	-.03 ^{pc.000}	-.20 ^{pc.005}	—	.62 ^{pc.000}	.41 ^{pc.000}
Pain Rating	-.44 ^{pc.000}	-.19 ^{pc.05}	-.18 ^{pc.05}	-.09 ^{pc.000}	.27 ^{pc.000}	.33 ^{pc.000}	.22 ^{pc.003}	-.11 ^{pc.000}	-.077 ^{pc.000}	—	

Regression analysis to predict Quality of Life

A multiple linear regression was calculated to predict quality of life based on demographic, physical activity, number of falls, and flexibility variables. This model was a good predictor of QoL, F(10,61)=2.38, p<.02, R² = .28, and predicted 62% of the variance.

Annual falls was the only predictor of quality of life (B=6.0, p<.000)

Variables	B	SE B	β	t	p
Demographic					
Age	0.095	0.235	0.048	0.403	0.688
Gender	6.476	4.031	0.2	1.607	0.113
Marital status	0.159	1.181	0.016	0.134	0.894
BMI	0.039	0.264	0.017	0.147	0.884
Physical activity					
Weekly exercise	1.586	1.667	0.132	0.951	0.345
Type of exercise practice	-1.215	0.831	-0.203	-1.461	0.149
Flexibility					
Lower body flexibility	-0.082	0.069	-0.159	-1.191	0.238
Upper body flexibility	0.072	0.055	0.175	1.302	0.198
Number of Falls in past year	6.040	1.637	0.465	3.689	0.000

Regression analysis to predict Annual Falls

A multiple linear regression was calculated to predict annual falls based on demographic, physical activity, quality of life, and flexibility variables. This model was a good predictor number of falls, F(10,61)=4.7, p<.000, R² = .60 and predicted 78% of the variance. Gender (β=.61, p<.02), and weekly exercise practice (β=.25, p<.02), type of exercise (β=.10, p<.05), physical functioning (β=.08, p<.02), mental depression (β=.14, p<.02), pain interference with activities (β=.13, p<.002), and pain rating (β=.11, p<.05) emerged as predictors of number of falls in the past year.

Variable	B	SE B	β	t	p
Demographic					
Age	-0.009	0.016	-0.061	-0.593	0.555
Gender	-0.608	0.233	-0.244	-2.403	0.020
Marital status	-0.008	0.077	-0.010	-0.099	0.922
BMI	0.013	0.019	0.076	0.690	0.493
Physical activity					
Weekly exercise	-0.251	0.102	-0.269	-2.464	0.017
Type of exercise practice	0.011	0.052	0.218	1.934	0.058
Flexibility					
Lower body flexibility	-0.006	0.004	-0.152	-1.371	0.176
Upper body flexibility	-0.002	0.004	-0.073	-0.635	0.528
Quality of Life					
Physical Functioning	-0.077	0.032	-0.330	-2.422	0.019
Anxiety	0.064	0.052	0.253	1.229	0.224
Depression	0.137	0.054	0.483	2.544	0.014
Fatigue	-0.146	0.040	-0.195	-1.162	0.250
Sleep Disturbance	0.021	0.029	0.079	0.724	0.472
Social Role	-0.019	0.029	-0.083	-0.659	0.513
Pain Interference	-0.127	0.040	-0.570	-3.176	0.002
Pain Rating	0.109	0.055	0.299	1.966	0.055

Discussion & Conclusion

The major finding of the present research was that number of fall in the last year was a strong predictor of quality of life in the elderly. Moreover, physical activity, mental disposition, and pain were important predictors of the number of falls in the last year. Altogether, this data suggest that these variables may indirectly influence quality of life by means of decreasing the risk of falling. It also supports to the known relationship between falling and quality of life in the elderly.

It was surprising that flexibility was not a predictor of quality of life or annual falls, at least in our sample of active and healthy elders. It is possible that the frequent exercising and active physical status of this group achieves more flexibility than what is necessary to impact falling in the general population. Although flexibility levels do not predict quality of life or annual falls, improved lower body flexibility was correlated with less annual falls, depression, fatigue, sleep disturbances, and pain interference with daily affairs. Better lower body flexibility also facilitated a more active social role. Actually, both lower and upper body flexibility were related to better social functioning. It is important to expand these findings in the general population, where flexibility and number of falls are more variable and may lead to poorer quality of life.

In summary, quality of life can be predicted by annual falls, while annual falls are predicted by physical functioning, weekly exercise, and mental depression. Furthermore, annual falls correlated with all spheres of quality of life. Similarly, lower body flexibility correlated with annual falls and most spheres of quality of life. However, it did not predict annual falls or quality of life.

Limitations

The present correlational study had several limitations, with the most significant being the high activity and physical level of the participants from the study. The recruitment was primarily conducted at a senior center where elders go to socialize and remain active. Other limitations of the study include the small sample size and the predominant participation of females over males. In the future, an expansion in population size and diversity of the sample in regards to activity level would most likely facilitate further areas of significance in regards to flexibility levels, quality of life components, and annual falling rates.

References

- Hindmarsh, J. J., & Estes, E. H. (1989). Falls in older persons. Causes and interventions. Archives of Internal Medicine, 149(10), 2217-22. Retrieved from <https://doi.org/10.1001/archint.149.10.2217>
- Baroni, B. M., Geremia, J. M., Rodrigues, R., Borges, M. K., Inada, A., Metzger, W., & Vaz, M. A. (2013). Functional and morphological adaptations to aging in knee extensor muscles of physically active men. Journal of Applied Biomechanics, 29(5), 535-542.
- de Oliveira, L. C., Pires-Oliveira, D. A. de A., Abucarub, A. C., Oliveira, L. S., & de Oliveira, R. G. (2016). Plates increase isokinetic muscular strength of the elbow flexor and extensor muscles of older women: A randomized controlled clinical trial. Journal of Bodywork and Movement Therapies. <https://doi.org/10.1016/j.jbmt.2016.03.002>
- Baraff, L. J., Della Penna, R., Williams, N., & Sanders, A. (1997). Practice guideline for the ED management of falls in community-dwelling elderly persons. Kaiser Permanente Medical Group. Annals of Emergency Medicine, 30(4), 480-492. <https://doi.org/S019664499030283> [pii]
- Rikli, R. E., & Jones, C. J. (2001). Senior fitness test manual. Champaign, IL: Human Kinetics (Vol. 1). <https://doi.org/10.3860/CHOICE.201-3447>
- Sherrington, C., Whitney, J. C., Lord, S. R., Herbert, R. D., Cumming, R. G., & Close, J. C. T. (2008). Effective exercise for the prevention of falls: A systematic review and meta-analysis. Journal of the American Geriatrics Society, 56(12), 2234-2243. <https://doi.org/10.1111/j.1532-5415.2008.02014.x>
- Kendrick, D., Carpenter, H., Richard, W. M., Dawn, A. S., Gage, H., Bowling, A., ... Iliffe, S. (2014). Exercise for reducing fear of falling in older people living in the community. Cochrane Database Syst Rev, (11). <https://doi.org/10.1002/14651858.CD009848.pub2>



Learning needs of nurses who support the discharge of elderly cancer patients

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Introduction①

□ In accordance with the “Basic Plan to Promote Cancer Control Programs,” improvement of the system to provide home medical care and nursing care services has been promoted in Japan. For example, “terminal cancer” was included as a specified disease in nursing-care insurance and various services such as home visit nursing care for terminal cancer patients at a special nursing home for the aged are now becoming available.

Introduction②

□ However, based on the actual situation of the elderly with cancer (hereinafter referred to as elderly cancer patients) after transferring from aggressive treatment to palliative care, many patients still spend their final days in hospital although deathbed at home or in facilities covered by long-term care insurance has increased. Accordingly, it is speculated that elderly cancer patients face various difficulties in transferring their medical care from hospitals to their own homes and in living there.

Introduction③

□ An overview of the surveys conducted recently in Japan indicated the possibility that both the intention of elderly cancer patients and their families regarding home medical care and the nursing practice situation could influence the decision regarding where medical care is performed and medical treatment continued. Based on this, in order to transfer medical care for elderly cancer patients from hospitals to their own homes, practical wisdom from nurses engaged in supporting these patients should be collected.

Introduction④

□ In this study, we collected opinions on the knowledge necessary for supporting elderly cancer patients especially from nurses who belong to a discharge support section of the hospital.

Purpose

□ This study aims to clarify nurses' knowledge and the discharge support they desire to provide for elderly cancer patients through learning.

Methods

□ From October 2017 to February 2018, semi-structured interviews were conducted with 18 nurses. We asked nurses, “what is the content you would like to learn to support elderly cancer patients?”

□ We focused specifically on four nurses who supported the discharge of elderly cancer patients, analyzed the data gathered from the interviews inductively, and described the categories that were generated.

□ Further, research began following approval from the Research Ethics Review Committee.

Results

Table1 Attribution of the survey participants

Years of No. experience as a nurse	Number of years in current section	Experience of participating in training in cancer care held at the facility in the past year	Experience of participating in training in cancer care held outside the facility in the past year	Experience of participating in training in discharge support in the past year (Details of training in discharge support)
1 10 years or more and less than 15 years	less than 3 years	Yes	No	Yes (Comprehensive Community Care System)
2 15 years or more	less than 3 years	Yes	No	Yes (Role of nurses in discharge support)
3 10 years or more and less than 15 years	less than 3 years	Yes	No	Yes (Support for those with discharge difficulty)
4 10 years or more and less than 15 years	less than 3 years	Yes	No	Yes (Support for decision making)

Table 2 Knowledge required for nurses in facilitating the transition from inpatient care to home care for elderly cancer patients

Category	Subcategory
Collaboration with professionals supporting home care and the social security system	Construction of network with professionals supporting community medicine
	Communication skills required in mutual support
	Social security system supporting the basis of home medical care
Need for paradigm shifts in home care	Acquisition of attitude to see patients themselves
	Shifting away from support for death to support for survival
	Avoid judgment on suitability of discharge home at nurses' discretion
	Realization of their own vision for discharge support

Table 3 Way of acquiring knowledge required for nurses in facilitating the transition from inpatient care to home care for elderly cancer patients

Category	Subcategory
Enforcing the reality regarding support for medical care at home	Communication of knowledge from home medical practitioners
	Group work that encourages realistic imaging
	Real experience of medical care at home
Fostering knowledge accompanying the accumulation of experience in discharging support	Emulation of a model nurse
	Accumulation of practical situation where acquisition of knowledge is required
	Attempt of self-education and self-learning
Feedback on results for supporting discharge	Understanding the patient's condition
	Confirmation of family evaluation

Discussion

□ The survey participants comprehended the current situation: factors such as family situation including the presence or absence of a caregiver and the medical condition of the cancer patients themselves influenced where medical care was provided and continued. However, they recognized that nurses should change their way of thinking regarding discharge support before considering the influence of these factors. It was revealed that “enhancing the reality regarding support for medical care at home” is an effective learning method.