

# EFFECTS OF AGE AND PHYSICAL ACTIVITY LEVEL ON BERG BALANCE SCORE IN ELDERLY THAI WOMEN

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## INTRODUCTION

Ability to control posture is important to maintain safety during functional activity of daily living. Reduction in balance has been related with high incidence of fall in elderly (Liechtenstein et al, 1988; Lord et al, 1994). Decreased physical activity has also been related with increased incidence of fall in elderly (Gill et al., 1995). In addition, evidence exists for age-related changes in postural control, which lead to balance impairment and fall (Liechtenstein et al, 1988; Lord et al, 1994; Tinetti et al, 1995). However, active elderly may be able to decrease the fall risk by maintaining balance through physical activity. Therefore, the purpose of this study was to determine the effects of age and physical activity level on the postural balance performance by using the Berg balance test (Berg, 1989) in elderly Thai female subjects.

## METHODS

Thai female subjects aged 60 years and over were recruited in this study. One hundred and nineteen elderly female subjects participated in this study. All subjects gave their consent and the Ethical Committee on Research Involving Human Subject, Faculty of Medicine Siriraj Hospital, Bangkok, Thailand approved the study.

Subjects were categorized into one of the following six groups based on age (WHO:

Young and Older elderly) and physical activity levels (High, Moderate, and Low).

The young elderly group aged from 60-74 years, while the older elderly group aged from 75-89 years. The selected four physical activities; going outdoors, exercises, activity of daily living and other activities, were used as criteria of physical activity levels (Jitapunkul et al., 1998). The high activity group was able to do all four activities, while the moderate and low groups were able to do any three and two of the four activities, respectively.

The Berg balance test was used to evaluate the postural balance performance of each subject. In addition, a questionnaire was also used to obtain information regarding history of fall and physical environment.

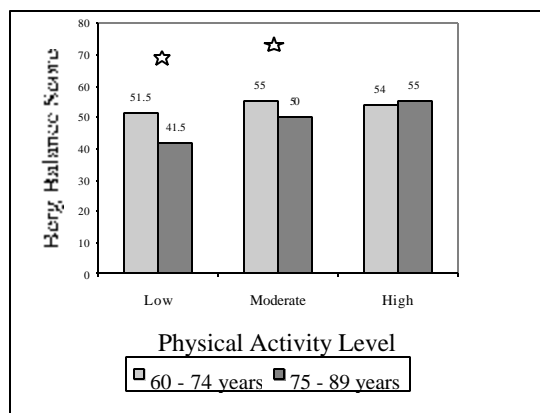
Non-parametric, two-way ANOVA was used to compare the effect of age and physical activity level on Berg balance score. Significant level was accepted at  $p < 0.05$ .

## RESULTS AND DISCUSSION

Ability to maintain balance was found to be more influenced by physical activity level as compared to age. When compared within age group, physical activity level was shown to effect Berg balance score (BSS). The high physical activity group demonstrated a significant higher BBS than the low physical activity group (Table 1). These results suggest that active elderly persons would be

able to maintain the ability to control both static and dynamic balance regardless of their age.

In the low and moderate activity level groups, the effect of age on BBS was accentuated. Significantly lower BBS was observed in older elderly groups as compared to the younger elderly groups (Figure 1). In addition, the lowest BBS of 41.5 was found in older elderly with low activity level. These results indicated that elderly persons with low physical activity level would be more susceptible to fall as compared to elderly persons with higher physical activity levels. Furthermore, these results also supported that higher activity level will enable the elderly persons to maintain their balance performance.



**Figure 1:** Comparison of Berg balance score between two age groups at low, moderate and high physical activity levels (\* $p < 0.05$ ).

## CONCLUSION

Physical activity such as going outdoors, sports and daily exercise, and activity of daily living, is shown to influence both static and dynamic balance performance in elderly persons as indicated by the BBS. Elderly persons with high physical activity are able to maintain their balance. Whereas, the elderly persons with low physical activity are at a greater risk of fall due to decreased control of balance.

## REFERENCES

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**Table 1:** Median (Q1, Q3) of Berg balance score of six groups of subjects

Group	Median (Q1,Q3)	p-value
60-74 years		
High (n=22)	54.0 (51.0,56.0)	p = 0.025 *
Moderate (n=25)	55.0 (51.0,56.0)	
Low (n=20)	51.5 (46.25,55.0)	
75-89 years		
High (n=12)	55.0 (50.75,56.0)	p = 0.001 *
Moderate (n=20)	50.0 (45.25,53.0)	
Low (n=20)	41.5 (37.5,50.75)	

\* = Statistically significant difference at  $p$ -value  $< 0.05$