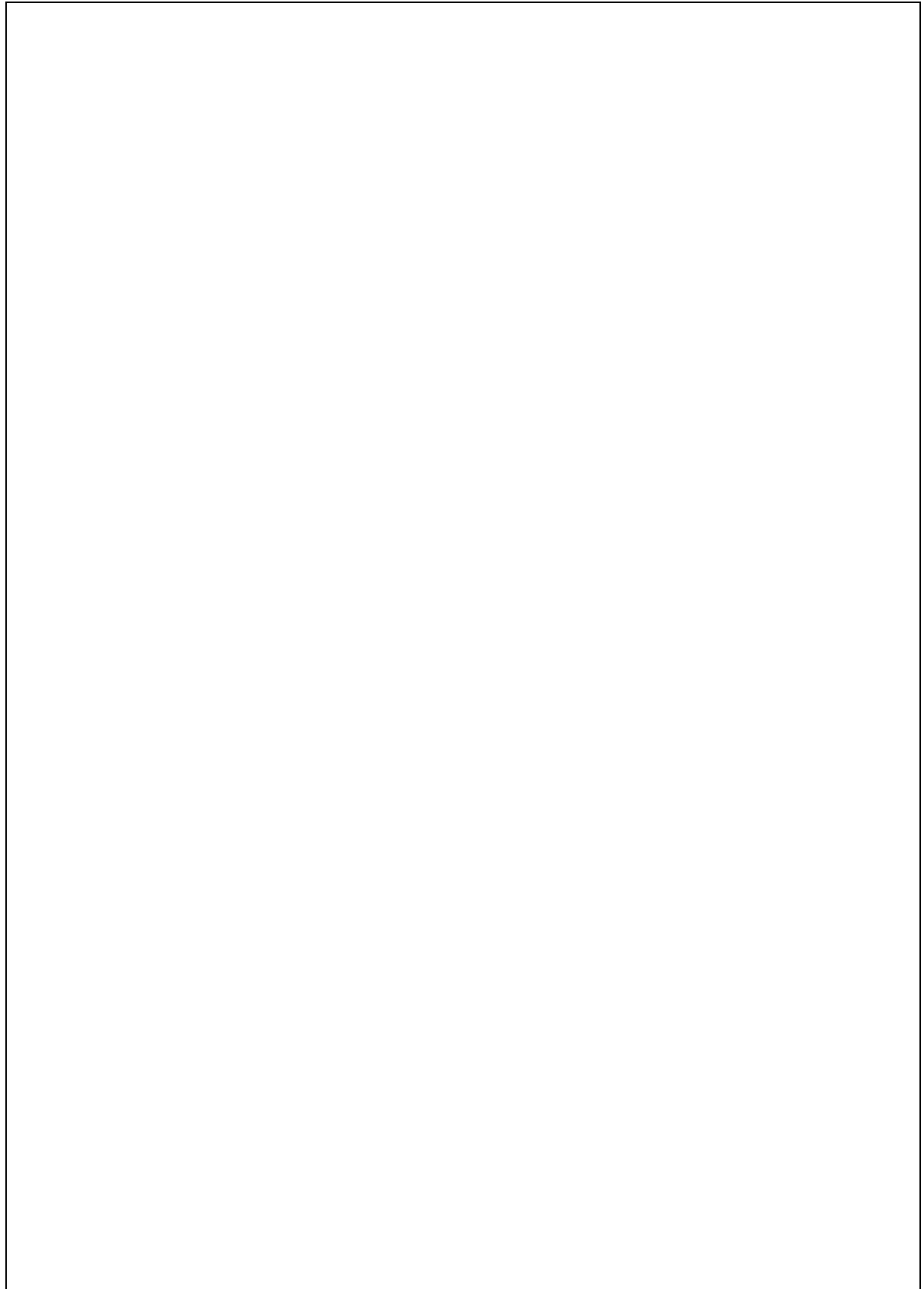


Paper Category:	Gerontechnology/e-health
Paper Title: (Arial Font; 14 Pt Size)	Reliability and Clinical Significance of Smartphone-Based Walking Pattern Analysis in Older Adults : The Bunkyo Health Study
Abstract Body: (Arial Font; 12Pt Size)	<ul style="list-style-type: none"> • Background • Objectives • Method • Results • Discussions and Conclusions
<p>(Maximum word limit - 300 words)</p> <p>Background and Objectives: The decline in walking speed and increased head wobble during walking is associated with reduced balance function in older adults. We investigated the reliability and clinical significance of walking patterns analysis using a smartphone.</p> <p>Methods: A total of 275 participants aged 70-90 years were enrolled from the Bunkyo Health Study. We evaluated maximum walking speed and the magnitude of the left-right sway amplitude of the head (wobble index) using videos captured by smartphones and specific application. Based on the median values of maximum walking speed (fast/slow) and wobble index (small/large), the participants were divided into four groups (fast/small, fast/large, slow/small, slow/large) and their functional mobility was compared. Logistic regression analysis was conducted to calculate the odds ratios (OR) of falls for each group.</p> <p>Results: The mean age of the participants was 77.1±5.2 years, with 112 males (40.7%) and 163 females (59.3%). Strong positive correlations were observed between the application-based measurements of normal or maximum walking speed and the actual measurements for both genders ($r=0.80-0.92$, $p<0.001$ for all). In the slow/large group, the performance in the five times sit-to-stand test was significantly worse compared to the other groups (fast/small: 6.40 ± 0.22 seconds, fast/large: 6.76 ± 0.29 seconds, slow/small: 7.72 ± 0.28 seconds, slow/large: 9.24 ± 0.22 seconds, $p<0.001$). The OR of falls in the slow/large group was 2.39 (95% CI 1.05-5.47) compared to the fast/small group.</p> <p>Conclusion: The measured walking speed using the smartphone and application showed good correlation and demonstrated reliability and validity when compared to actual measurements. Older adults with slower maximum walking speed and larger head wobble were found to have decreased functional mobility and an increased risk of falls.</p>	



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