Two-year longitudinal relationships between frailty, cognitive function, and fall in community-dwelling older Korean adults

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Purpose Frailty and cognitive function are known factors associated with falls (Fhon et al., 2016; Kim, 2020; Robertson et al., 2014). The identification of preventable factors related to falls is a public health priority. This study aimed to determine the longitudinal relationships between frailty, cognitive function, and falls among community-dwelling older people. **Method** This study utilized data from the first (2016–2017) and second (2018–2019) waves of the Korean Frailty and Aging Cohort Study; 2318 people aged ≥70 years were included. Frailty was assessed with the Fried frailty index (Fried et al., 2001), comprising five domains: unintentional weight loss, weakness, exhaustion, slowness, and low activity. The total frailty score calculated through the sum of the scores assigned to each of the five domains ranged from 0–5, with higher scores reflecting increased frailty level. Fall experience was classified into the presence or absence of a fall in the past year. A score of 0 indicated no experience of falls, and 1 indicated at least 1 fall experience. Cognitive function was measured using the Mini-Mental State Examination (MMSE), which assesses global cognition. It consists of a range of 0–30 points with a total of 30 questions, with higher scores reflecting an intact cognitive function. Descriptive statistics and Pearson's correlation coefficient were used to identify relationships among these variables. **Results and Discussion** Over time from Wave 1 to Wave 2, the participants' frailty increased, cognitive function declined, and fall experience increased. A significant positive correlation existed between fall at Wave 1 and fall at Wave 2 (r=.180, $p < 0.001$); frailty at Wave 1 and fall at Wave 2 (r=.120, $p < 0.001$); MMSE at Wave 1 and fall at Wave 2 (r=-.069, $p < 0.001$; Table 1). The results showed that higher frailty level at Wave 1 was correlated with more fall experiences at Wave 2 and higher MMSE score at Wave 1 was correlated with absence of fall experiences at Wave 2. Healthcare providers should plan fall-prevention programs considering the improvement of physical frailty and improvement/maintenance of cognitive function. It is necessary to provide a customized program tailored to one's condition by early detection of the older people with a high level of frailty and/or low cognitive function as well as those with fall experience. Specifically, technology can improve physical frailty and cognitive function in older people and may help with fall prevention programs. Targeting improvement of frailty is a feasible approach to reducing the burden of falls among older people, fall prevention is an effective method for preventing another possible fall among older adults in the future.

References

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Table 1 Correlation between frailty, cognitive function, and fall at each wave (*N*=2318)

Variables	Frailty_W1	Frailty_W2	MMSE_W1	MMSE_W2	Fall_W1	Fall_W2
	r (*p*)	r (*p*)	r (*p*)	r (*p*)	r (*p*)	r (*p*)
Frailty_W1						
Frailty_W2	.516 (<.001)					
MMSE_W1	-.289 (<.001)	-.272 (<.001)				
MMSE_W2	-.294 (<.001)	-.283 (<.001)	.658 (<.001)			
Fall_W1	.137 (<.001)	.113 (<.001)	-.053 (.011)	-.026 (.204)		
Fall_W2	.120 (<.001)	.167 (<.001)	-.069 (.001)	-.040 (.055)	.180 (<.001)	

Note: MMSE=mini-mental state examination, W1=wave 1, W2=wave 2