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The influence of lower-extremity function in elderly individuals' quality of life (QOL): An analysis of the correlation between SPPB and EQ-5D

Bumjo Oh [a], Belong Cho [a,*], Ho-Chun Choi [a], Ki-Young Son [a], Sang Min Park [a], Sohyun Chun [a], Sung-Il Cho [b]

[a] Department of Family Medicine, Seoul National University Hospital, Seoul, Republic of Korea
[b] Division of Epidemiology, School of Public Health, Seoul National University, Seoul, Republic of Korea

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ABSTRACT

Background: If an association between a decline in physical performance and subjective QOL is confirmed, the SPPB could be used as a predictor for declining QOL in older people.
Objective: This study aimed to elucidate the association between the short physical performance battery (SPPB) and QOL (EQ-5D) to determine the utility of the SPPB as a predictor of declining QOL.
Methods: The SPPB and the EQ-5D test were performed with a random sample of participants nested in the Korean Longitudinal Study of Aging (KLoSA) panel. Comparisons of the adjusted mean scores on the EQ-5D index between normal and abnormal SPPB groups were performed. We selected the quartiles of the EQ-5D index variables for the analysis. The association between the EQ-5D index and SPPB abnormality was examined using multinomial logistic regression analysis. Additionally, the associations between gait speed and chair stand time and the EQ-5D index were examined using the same analysis.
Results: Four hundred and twenty-two subjects were included in the analysis. The adjusted means for the EQ-5D index were significantly lower when the SPPB score was abnormal ($p = 0.022$ for men, $p = 0.047$ for women). An abnormal SPPB score was significantly associated with the lowest quartile of EQ-5D index score (adjusted OR 3.54 in the lowest quartile for men; adjusted OR 2.50 and 3.37 in the lowest and second quartiles for women). Gait speed was significantly associated with the EQ-5D index for participants of both sexes, but standup time was associated with the EQ-5D index only for men.
Conclusions: An abnormal SPPB score was associated with lower QOL. Thus, the SPPB has the potential to be used as an early predictor of declining QOL in clinical settings and epidemiological studies.
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1. Introduction

Korea has had a large proportion of elderly individuals since 2000. With ongoing physiologic aging and a higher prevalence of chronic degenerative diseases, the decline of physical and emotional health status is on the rise. Accordingly, the elderly population poses a challenge to minimize disability and improve QOL (WHOQOL, 1995).

The ultimate purpose of assessing physical function in the old age is to detect, correct and reverse the decline of physical function or vulnerability in a timely fashion, allowing elderly people to maintain an independent and physically active lifestyle. Among diverse tests of physical function, the SPPB, also known as SPPB, is known to predict declining functional ability and nursing home admission rates in both high-risk groups whose functionality has deteriorated to a certain level and low-risk groups whose functionality is relatively well-preserved (Guralnik et al., 1995; Studenski et al., 2003). The SPPB tests predict falls, inflammatory reactions, disability and nursing home admission rates, and they assess maximum functional outcome rather than lower extremity disability by including tests of standing balance, normal gait speed and timed sit-to-stand (Guralnik et al., 1989). Some researches have been conducted on the effects that physical activity has on psychological well-being or QOL in older adults (Beswick et al., 2008; Buchner et al., 1992; Chun, 2012; Kerse et al., 2008; Penninx et al., 2000).

The 5-dimensional EuroQol (EQ-5D), which reflects health-related QOL, is also widely used because of its brevity and international comparability (Dolan, 1997; The EuroQol Group,

* Corresponding author at: Department of Family Medicine, Seoul National University Hospital, 101 Daehak-ro, Jongno-gu, Seoul 110-744, Republic of Korea. Tel.: +82 2 2072 2195/10 9865 2195; fax: +82 2 766 3276.
E-mail addresses: belong.cho@gmail.com, belong@snu.ac.kr (B. Cho).

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1990). Physical function and QOL represent two major components of multidimensional evaluation in older people. There are few previous reports, however, of direct studies on the association between the two. This study aimed to identify the association between overall QOL and physical function in an elderly population. Moreover, it could be possible for us to assume the QOL by means of simple physical function test.

Using the KLoSA dataset, those who had participated in the physical function test SPPB and who had also responded to EQ-5D questionnaires were selected. We tested whether a significant relationship existed between the two scores and whether specific physical functions had an influence on QOL.

2. Methods

2.1. Study population

The KLoSA is a national project first conducted in 2006 to respond to the need for evidence-based policies to address the aging trend of the population. The project was modeled after panel studies of the middle-aged and elderly populations in the United States and the United Kingdom, and the purpose was to generate data comparable with similar studies in other countries and to provide a foundation for policy-making and academic research (Kim et al., 2011).

The participants were drawn randomly from the second wave of the 2006 KLoSA. Every step proceeded in close consultation with the KLoSA research team. Expert interviewers from the KLoSA research team administered additional in-depth questionnaires and obtained informed consent for biomarker testing. Nurses contacted and visited those who agreed to the testing for measurements. After excluding 105 subjects who had not participated in the SPPB or had not answered the EQ-5D questionnaire, 422 subjects were included in the final analysis (Fig. 1).

2.2. Study design and materials

The patients underwent baseline assessments of their demographic characteristics. Physical performance was evaluated on 3 types of balance tests, a gait speed test, a leg raise test, a chair stand test, and a 4-m walk test. Using internationally validated assessment tools, additional questionnaires were administered to the patients to assess important factors that were not included in the panel study, such as QOL, fatigue, physical activity, mobility and medical checkups (Guralnik et al., 1994).

The SPPB reflects physical function, and it is composed of tests of standing balance, normal gait speed and timed sit-to-stand. Only those who can stand on their feet without the help of a cane or a walker are eligible for the standing balance test. The respondents

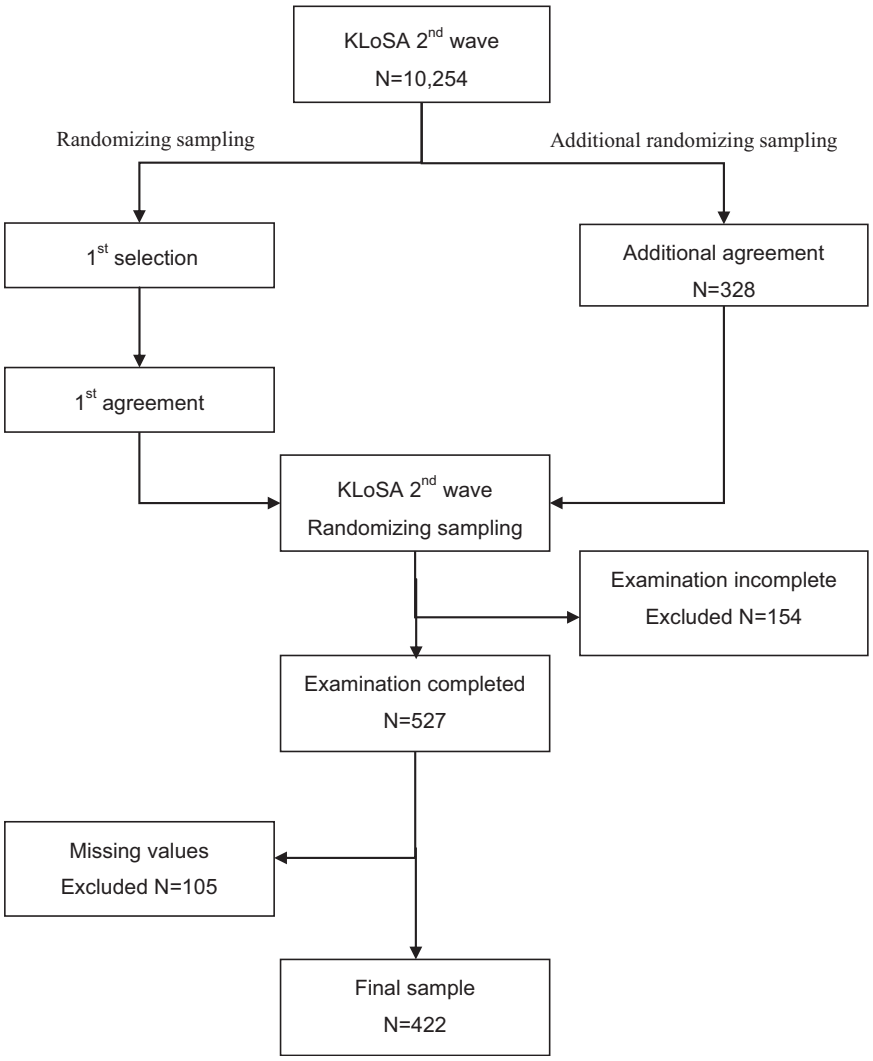

Fig. 1. Sampling strategy.

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