



# An adaptation of the Korean mini-mental state examination (K-MMSE) in elderly Koreans: Demographic influence and population-based norms (the AGE study)

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## Abstract

The mini-mental state examination (MMSE) is a brief global instrument used to assess cognitive abilities, and has been translated into the K-MMSE. The clinical value of the K-MMSE is restricted by the small amount of normative data available, especially for the elderly population. We investigated the population-based data of K-MMSE scores to obtain the norms

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specific for the sociodemographic characteristics of elderly Koreans. The K-MMSE was applied to a cognitively normal sample of 977 subjects aged 60–84 years in Ansan, South Korea. We determined whether the sociodemographic characteristics were related to the K-MMSE scores and calculated the norms. The K-MMSE score was significantly associated with age, gender, and level of education, and this result was used to develop normative data with age, gender, and educational strata. The normative data based on age, gender, and level of education presented here are suitable for clinical use.

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## 1. Introduction

Declining birth rates, increasing life expectancies, and improving economies are increasing the elderly populations in most countries (Levkoff et al., 1995), including South Korea (MOHW, 2002.). Cognitive dysfunction, such as dementia, is one of the most distressing and burdensome health problems associated with the elderly population. Testing for cognitive dysfunction requires community screening with neuropsychiatric tests that are applicable to the cultural background of the study population. This requires translation and the cultural adaptation of such screening instruments. The lack of such culturally appropriate screening instruments hinders studies on cognitive dysfunction in many countries, especially non-Western countries.

The MMSE developed by Folstein et al. (1975) is the most widely used instrument for measuring global cognitive performance and for identifying individuals with cognitive dysfunction. The elderly exhibit a high prevalence of cognitive dysfunction that may influence their test performance, and therefore their normative data may differ from those in younger subjects. Thus, the norms for the MMSE have been primarily presented for the elderly population (Folstein et al., 1975; Bleecker et al., 1988; Heeren et al., 1990; Ganguli et al., 1991; Ylikoski et al., 1992; Cobb et al., 1993; Crum et al., 1993; Monsch et al., 1995; Bravo and Hebert, 1997; Jacqmin-Gadda et al., 1997; Reischies and Geiselmann, 1997).

The MMSE, variously modified and translated into several languages, has been used successfully in several independent cross-national studies of dementia epidemiology (Brayne, 1998). The MMSE was modified and translated into Korean by Kang et al. (1997), and the resulting K-MMSE has been widely used in clinical evaluations and research involving patients with dementia in Korea. Despite research results supporting the favorable psychometric features of the K-MMSE, the clinical value of the instrument is restricted by the small amount of normative data available, especially for the elderly population (Kang and Na, 2003).

The purpose of the present study was to describe the first wave of the Ansan Geriatric study (AGE study) and to evaluate the normative data of the K-MMSE for elderly Koreans, the applicability of the K-MMSE to elderly Koreans, and the influence of age, gender, level of education and other sociodemographic characteristics on the K-MMSE score among elderly Koreans.

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