



■ Editorial

Grip Strength as a Cardiometabolic Marker

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Muscle weakness is a key component of sarcopenia and frailty in older adults^{1,2)} and is used as an indicator of malnutrition.³⁾ Grip strength measurements using a handgrip dynamometer are recommended for the assessment of muscle weakness as the method is easy, quick, noninvasive, and reliable for measuring the maximum voluntary force of the hand. It is relatively inexpensive and can be used in both clinical and community settings.⁴⁾ Grip strength can provide information regarding an individual's nutritional status, muscle mass, physical function, and health status.^{5,6)}

Several studies conducted on the Korean population have evaluated muscle strength using grip strength measurement in the *Korean Journal of Family Medicine*.⁷⁻¹²⁾ Most studies used national databases such as the Korea Health and Nutrition Examination Survey (KNHANES)^{7,8)} or the Korean Longitudinal Study of Aging.¹⁰⁻¹²⁾

However, there is no established standard protocol for measuring and reporting grip strength data.¹³⁾ Some studies used the absolute or dominant grip strengths, which were defined as the sum of the largest readings for both hands, and the grip strength of the dominant hand, respectively, whereas other studies used the mean grip strength of both hands. Relative grip strength is defined as the absolute grip strength divided by body mass index (BMI). Recently, BMI adjusted for muscle strength is used as a muscle quality index. For instance, the Foundation for the National Institutes of Health Sarcopenia Project has proposed a new approach for sarcopenia diagnosis wherein muscle weakness is adjusted for BMI instead of body weight or height.¹⁴⁾ Cardiometabolic risk had a stronger association with relative grip strength than with absolute grip strength.¹⁵⁾ However, Ho et al.,¹⁶⁾ revealed that both the abso-

lute and relative grip strengths had similar predictive abilities for cardiovascular disease and all-cause mortality.¹⁶⁾

Using the KNHANES 2015–2016, Chong et al.¹⁷⁾ assessed the association between the absolute and relative grip strengths and cardiometabolic outcomes in a Korean adult population stratified by sex and age. Grip strength measurements could be affected by the protocol used. After multiple measurements, the grip strength could reduce, and the maximum grip strength may be greater than the mean value of three trials. Therefore, Chong et al.¹⁷⁾ used the Southampton protocol to measure handgrip strength (HGS) following the suggestion of Roberts et al.¹³⁾ Chong et al.¹⁷⁾ revealed that grip strength has a negative relationship with BMI, high-sensitivity C-reactive protein (hsCRP), and diabetes, and a positive relationship with physical activity in youths of both sexes. However, there were no significant association between dominant grip strength and BMI, relative grip strength and hsCRP, or relative grip strength and diabetes in elderly persons of both sexes. Compared to the absolute HGS, the relative HGS did not show a stronger association with hsCRP, blood pressure, BMI, and physical activity duration. However, the relative HGS showed a positive association with high-density lipoproteins in men aged 20–64 years. Our study suggests that grip strength may be a reliable index to screen for cardiometabolic disease.

Recently, normative reference values for grip strength across the lifespan in a Korean population aged 10–80 years have been published based on KNHANES 2014–2015.¹⁸⁾ Age-related declines in grip strength were shown to begin as early as in the fifth decade of life. The life course trajectory identified for muscle weakness and any cutoff values related to relevant health outcomes were paramount.

Thus, grip strength could be used as a biomarker of healthy aging for people of all ages and may be an effective screening

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tool for cardiometabolic disease.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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