

REFERENCE VALUES FOR HANDGRIP STRENGTH IN AMONG HEALTHY YOUNG ADULTS*

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RESUMEN ANALÍTICO ESPECIALIZADO (RAE)

DESCRIPTION: Isometric grip strength, evaluated with a handgrip dynamometer, is a marker of current nutritional status and cardiometabolic risk and future morbidity and mortality.

SOURCE: Low handgrip strength (HGS), as determined with a handgrip dynamometer, is recognized as a marker of poor nutritional status and early marker of nutritional deprivation¹. Low HGS is a predictor of poor clinical outcomes in hospitalized patients including longer length of stay, complications and mortality¹⁻³. Lower HGS in middle aged and elderly subjects has been shown to predict functional limitations, disability^{2,3} and cardiovascular and all-cause mortality⁴. There is also accumulating evidence that from an early age HGS is inversely associated with cardiometabolic risk factors⁵⁻⁷ and that lower HGS in young adulthood is a predictor of cardiovascular disease and mortality^{8,9} in adulthood, independent of body mass index and cardiorespiratory fitness¹⁰. Notably, while strength and muscle mass are well correlated, associations between HGS and markers of health or health outcomes appear to persist after adjusting for the latter¹⁻⁹. Therefore, the assessment of muscle function or “muscle quality” permitted by handgrip dynamometry may be an earlier and more sensitive marker of poor outcomes associated with malnutrition^{1,10,11}. The relatively low cost and the simplicity and speed with which HGS can be measured also make it attractive tool for clinical or naturalistic settings¹¹.

Numerous studies have evaluated the association between HGS and current or future health in different age groups, in healthy populations and those with disease, and from diverse geographic regions¹²⁻²³. These analyses consistently show higher HGS in males at all ages except in children, with peak grip strength observed in the fourth decade followed by a gradual decline in both genders¹²⁻²³. Nonetheless, there is a paucity of data in Latin American populations and reference values for handgrip strength for the Colombian population following a standardized protocol such as that of the American Society of Hand Therapists (ASHT)¹⁸ are lacking. Population-specific reference values are important for tracking of secular trends for handgrip in the population and to enable the screening and identification both of low handgrip strength as a risk factor, as well as reductions in muscle strength associated with poor nutritional status or underlying disease.

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AIM & CONTENT: Therefore the principle aim of this study was to establish reference values for handgrip strength in healthy Colombian adults. We also aimed to evaluate sex and age related differences amongst the population.

METHODS: The sample comprised 5.647 (2.330 men and 3.317 women) apparently healthy young university students (mean age, 20.6±2.7 years) attending public and private institutions in the cities of Bogota and Cali (Colombia). Handgrip strength was measured two times with a TKK analogue dynamometer in both hands and the highest value used in the analysis. Sex- and age-specific normative values for handgrip strength were calculated using the LMS method and expressed as tabulated percentiles from 5 to 95 and as smoothed centile curves (P₅, P₂₅, P₅₀, P₇₅ and P₉₅).

RESULTS: Mean values for right and left handgrip strength were 38.1±8.9 and 35.9±8.6 kg for men, and 25.1±8.7 and 23.3±8.2 kg for women, respectively. Handgrip strength increased with age in both sexes and was significantly higher in men in all age categories. The results were generally more homogeneous amongst men than women.

CONCLUSION: Sex- and age-specific handgrip strength normative values among healthy young Colombian adults are defined. This information may be helpful in future studies of secular trends in handgrip strength and to identify clinically relevant cut points for poor nutritional and elevated cardiometabolic risk in a Latin American population. Evidence of decline in handgrip strength before the end of the third decade is of concern and warrants further investigation.

KEYWORDS: Adults; Dynamometer; Grip strength; Reference values.

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