Muscular Strength as a Predictor of All-Cause Mortality in an Apparently Healthy Population: A Systematic Review and Meta-Analysis of Data From Approximately 2 Million Men and Women

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Objectives: The aims of the present systematic review and meta-analysis were to determine the relationship between muscular strength and all-cause mortality risk and to examine the sex-specific impact of muscular strength on all-cause mortality in an apparently healthy population. Data Sources: Two authors systematically searched MEDLINE, EMBASE and SPORTDiscus databases and conducted manual searching of reference lists of selected articles. Study Selection: Eligible cohort studies were those that examined the association of muscular strength with all-cause mortality in an apparently healthy population. The hazard ratio (HR) estimates with 95% confidence interval (CI) were pooled by using random effects meta-analysis models after assessing heterogeneity across studies. Data Extraction: Two authors independently extracted data. Data Synthesis: Thirty-eight studies with 1,907,580 participants were included in the meta-analysis. The included studies had a total of 63,087 deaths. Higher levels of handgrip strength were associated with a reduced risk of all-cause mortality (HR=0.69; 95% CI, 0.64-0.74) compared with lower muscular strength, with a slightly stronger association in women (HR=0.60; 95% CI, 0.51-0.69) than men (HR=0.69; 95% CI, 0.62-0.77) (all P<.001). Also, adults with higher levels of muscular strength, as assessed by knee extension strength test, had a 14% lower risk of death (HR=0.86: 95% CI, 0.80-0.93; P<.001) compared with adults with lower muscular strength. Conclusions: Higher levels

of upper- and lower-body muscular strength are associated with a lower risk of mortality in adult population, regardless of age and follow-up period. Muscular strength tests can be easily performed to identify people with lower muscular strength and, consequently, with an increased risk of mortality.

Death

Hand strength

Leg strength

Muscles

adult

all cause mortality

article

cohort analysis

controlled study

data extraction

data synthesis

death

Embase

female

follow up

grip strength

hazard ratio

human

knee

male

Medline

meta analysis

mortality risk

muscle strength

risk assessment

systematic review

aged

cause of death

health survey

middle aged

mortality

muscle disease

muscle strength

pathophysiology

physiology

proportional hazards model

sex ratio

Adult

Aged

Cause of Death

Cohort Studies

Female

Humans

Male

Middle Aged

Muscle Strength

Muscular Diseases

Population Surveillance

Proportional Hazards Models

Sex Distribution