Grip Strength and Quality of Life Among Community-Dwelling Older Adults

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Objectives

• Discuss aging population
• Discuss grip strength
• Discuss quality of life (QoL)
• Discuss implications for occupational therapy (OT)
FIGURE 5 The Number of 65-Plus Americans Is Projected to Grow Rapidly | POPULATION 65 YEARS AND OLDER, 1900–2050

Source: U.S. Census Bureau, compiled by the U.S. Administration on Aging, 2008.

CROSSING THE THRESHOLD

A person’s grip strength begins to decline at around the age of 30, with an acceleration in his or her 60s. Working groups established to define sarcopenia do not agree fully on the point at which low strength should be considered a feature of the disease. But by the age of 85, most people’s strength will fall below a clinical threshold for sarcopenia. However, not all people with such a strength will meet the full criteria for the disease.

![Graph showing grip strength decline with age for males and females, with thresholds for sarcopenia from different groups.](https://www.nature.com/articles/d41586-018-02479-z)
Grip Strength and Mortality

For those with low grip strength, rates of survival are significantly lower

*Survival rate based on age grip strength*

**Norm:**
- 70-78 – 81.2%
- 78-85 – 72.0%
- 85-90 – 70.1%
- 90-95 – 65.5%

**Low grip strength:**
- 70-78 – 77.8%
- 78-85 – 51.0%
- 85-90 – 49.2%
- 90-95 – 40.6%
Is grip strength related to quality of life among community-dwelling older adults?

QoL defined as
  • Independence with activities of daily living (ADLs)/instrumental activities of daily living (IADLs)
  • Physical disability
  • Mobility
Methods

**WMU Library databases**
- PubMed
- Clinical Keys
- National Institute of Health (NIH)
- Springer Link
- Scopus
- BioMed Central
- Wiley
- Oxford Academics

**Search Terms**
- Grip strength
- Quality of life
- Muscle strength
- Older adults
- Physical functioning
- Physical health
- Functional health
- Functional mobility
- Frailty
Search Criteria

*Peer-reviewed articles*
- Between 2008-2018
- English language

*Inclusion*
- Relatively healthy samples
- Community-dwelling older adults
- Ages: 55+

*Exclusion*
- Cognitive and psychological deficits
- QoL focused on social participation
- Chronic condition
Results

Identified 9 Studies

Study Designs
• 5 Cross Sectional
• 2 Longitudinal w/ Follow-Up
• 1 Quasi-Experimental
• 1 Double-Blind
Themes

1. Grip strength is strongly correlated with ADL/IADL independence.

*Example – Barbat-Artigas et al. (2013)*

**Method**
- Grip strength measured through 3 trials on dominant hand only
- ADL/IADL independence measured through self-reported questionnaires
- Large sample (n=1,462)

**Result**
- Those with low grip strength to have 2x higher risk of functional dependence
2. Grip strength is correlated with physical disability.

*Example – Peterson et al. (2017)*

**Method**
- United States – grip strength measure through maximal score after 3 trials on dominant and nondominant hand
- China – grip strength measured through maximal score after 2 trials on dominant and nondominant hand
- Physical disability was measured through self-reported questionnaires in both countries
- Large representative sample (US n=4,544; China n=6,030)

**Result**
- Poorer grip strength indicated a 2x greater risk of physical disability in both men and women in both countries
3. Grip strength is correlated with mobility limitations.

*Example – Kang, Lim, & Park (2018)*

**Method**
- Grip strength measured using maximal score after 3 trials on dominant hand only
- Mobility measured through self-reported questionnaires
- Large representative sample (n=4,620)

**Results**
- Men with lower grip strength have a 2x greater risk of mobility limitations.
- Women with low grip strength have a 3x greater risk of mobility limitations
- Both men and women with low grip strength are also at a 1.5x greater risk of experiencing pain in mobility
Conclusion

• Grip strength appears to have a strong relationship with QoL in community-dwelling older adults

• May have a bidirectional relationship

• Further research is needed
  • Longitudinal design
  • Advanced age
  • Greater standardization
    • Assessment
    • Protocol
  • Impact studies on functional performance

https://www.health.harvard.edu/blog/grip-strength-may-provide-clues-to-heart-health-201505198022
Implications for Occupational Therapy
OT-based Measures

**Grip Strength** – dynamometer

**QoL**

**Self-Report**
- SF-12 & SF-36
- Functional Independence Measure
- ADL Checklist
- Lawton IADL Scale
- Katz Index of Independence

**Clinician Assessed**
- AM-PAC
- Modified Barthel Index
- Stroke Impact Scale

[Home Care Checklist](https://myemail.constantcontact.com/Free-Printable-Home-Care-ADL-Checklist-for-Occupational-Therapists.html?soid=1102776233472&aid=1mqts6T1Znk)
Improving Grip Strength

Occupation-based

*Examples*
- Using spray bottles to water plants
- Rolling out dough with a rolling pin
- Wood-working projects that require the use of a hammer
Exercise-based

**Examples**

- Wrist extension/flexion
- Wrist extension/flexion with weights
- Thumb extension/flexion

**Tools**

- Vive Hand exercisers
- Theraputty
- Stress balls
- Ergonomic Hand Grip
- Hand Exercise Board with Hood and Loop Fasteners
- Slo-Foam
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Questions?
References


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