

Association Between the Finger-Ring Test and Quality of Life in Community-Dwelling Older Women: Cross-sectional study

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Introduction

Sarcopenia is common in the elderly population and is characterized by decreased muscle mass, muscle strength, and physical performance. The finger-ring test is one of the screening methods for sarcopenia, in which an individual forms a ring using the index finger and thumb of both hands to encircle the calf. The test compares calf circumference to the size of the ring; if the calf is thinner than the ring, the individual is considered at high risk for sarcopenia. This study aims to assess the effectiveness of the finger-ring test and its association with quality of life in community-dwelling females aged 65 years and older.

Methods

This study was conducted on women aged 65 years or older residing in the community who were capable of using an Android smartphone and a mobile application without difficulty. A self-developed mobile application was used to perform the finger-ring test (Figure 1). The participants were categorized into risk groups based on their test results, and each group underwent sarcopenia-related evaluations, including skeletal muscle mass measurement, grip strength assessment, and functional performance tests (SPPB, five-time chair rise test, and gait speed assessment). Additionally, quality of life was measured using the SarQoL questionnaire. For statistical analysis, one-way ANOVA was used for continuous variables, and Chi-square tests were used for categorical variables to compare the differences among groups.



Fig. 1. Finger-ring test, reprinted from <https://www.alpropharmacy.com>

Results

Table 1. Baseline Demographics According to Finger-Ring Test Results

F (n=66)	Bigger (19)	Just fit (29)	Smaller (18)	P-value
Age (Yrs)	68.79 (3.17)	73.93 (6.06)*	75.50 (5.76)*	0.001
Weight (kg)	63.29 (7.55)	58.40 (8.51)	54.19 (6.66)*	0.003
Height (cm)	157.22 (4.24)	154.33 (3.84)	154.77 (4.61)	0.061
BMI (kg/m ²)	25.55 (2.57)	24.48 (3.26)	22.62 (2.77)*	0.013
HTN	6 (31.6%)	14 (48.3%)	8 (44.4%)	0.509
Dyslipidemia	8 (42.1%)	19 (65.5%)	10 (55.6%)	0.226 ^a
Diabetes	2 (10.5%)	5 (17.2%)	6 (33.3%)	0.153 ^a
SARC-F	0.474 (0.841)	0.828 (1.00)	2.00 (1.78)*	0.005^b
SNQ	14.42 (1.57)	14.24 (1.55)	14.11 (1.45)	0.735 ^b

*Compared to the baseline, post-hoc analysis revealed a statistically significant difference.

a: Fisher's Exact test, b: Kruskal-Wallis test

Table 2. muscle mass, muscle strength, and physical performances according to the results of finger-ring test

F (n=66)	Bigger (19)	Just fit (29)	Smaller (18)	P-value
SMM (kg)	21.71 (2.33)	19.81 (1.96)*	19.13 (2.00)*	0.001
SMI (kg/m ²)	6.62 (0.54)	6.16 (0.57)*	5.91 (0.55)*	0.001
PBF (%)	35.85 (5.86)	34.05 (8.45)	32.49 (7.02)	0.390
WBPA	5.22 (0.47)	4.99 (0.58)	4.66 (0.63)*	0.014
HGS (kg)	24.85 (4.06)	21.94 (3.23)*	22.56 (3.29)	0.021
SPPB	11.47 (0.77)	11.48 (0.78)	11.17 (0.99)	0.409
5CT (s)	10.25 (2.21)	10.56 (2.48)	11.15 (2.65)	0.530
Gait speed (m/s)	1.18 (0.17)	1.20 (0.17)	1.17 (0.16)	0.795
TUG (s)	8.27 (1.29)	8.39 (1.07)	8.61 (1.31)	0.805 ^a

a: Kruskal-Wallis test

SMM, Skeletal Muscle Mass; SMI, Skeletal Muscle Index; HGS, Hand Grip Strength; SPPB, Short Physical Performance Battery; 5CT, 5-time Chair raise test; TUG, Timed up and go Test

Table 3. Results of quality-of-life questionnaires according to Finger-Ring Test Results

SarQoL	Bigger (19)	Just fit (29)	Smaller (18)	P-value
D1 physical and mental health	71.26 (17.12)	67.89 (16.69)	64.06 (12.47)	0.391 ^a
D2 locomotion	82.75 (11.61)	72.29 (15.02)	70.02 (19.49)*	0.049
D3 body composition	69.74 (18.04)	65.80 (18.73)	59.02 (18.73)	0.209
D4 functionality	86.94 (8.68)	80.67 (11.42)	71.12 (13.40)*	0.000
D5 activities of daily living	82.68 (12.39)	78.43 (14.69)	68.24 (16.50)*	0.011
D6 leisure activities	62.14 (19.05)	56.77 (15.70)	54.52 (21.17)	0.390 ^a
D7 fears	93.42 (7.65)	91.38 (8.25)	84.03 (11.18)*	0.010^a
Total Overall	81.00 (9.36)	75.88 (10.46)	68.06 (13.78)*	0.003

*Compared to the baseline, post-hoc analysis revealed a statistically significant difference.

a: Kruskal-Wallis test

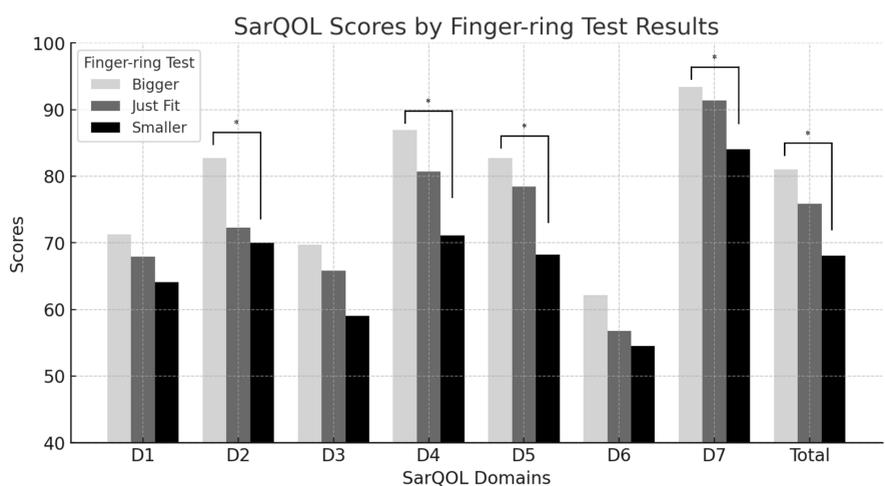


Figure 2. Results of quality-of-life questionnaires according to Finger-Ring Test Results

Conclusions

The finger-ring test is a simple and easily measurable tool that demonstrated an association with quality of life scores rather than skeletal muscle mass or functional test results.

