Associations of Cardiorespiratory Fitness and Percent Body Fat with Health-Related Quality of Life in Elderly

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Background

- As life expectancy increases, overall health and quality of life become more important, especially, as chronic diseases become more prevalent.
- Health-Related quality of Life (HRQoL) examines eight dimensions of health and within certain populations, it has been found to be predictive of mortality and cardiovascular diseases.
- Cardiorespiratory fitness may be a protective factor for cardiovascular disease morbidity and mortality and all-cause mortality (Lee, Artero, Sui, & Blair, 2010).
- As percent body fat increases and cardiorespiratory fitness decreases, the risk of cardiovascular risk factors (hypertension, metabolic syndrome, and hypercholesterolemia) increases (Lee, et al., 2012).

Purpose: To investigate the cross-sectional associations of cardiorespiratory fitness (CRF) and percent body fat (PBF) with Health-Related Quality of Life (HRQoL) in older adults.

METHODS

- **Study Design:** Cross-sectional study
- **Participants:** 282 older adults, ≥65 years (mean age 74, range 66-97 years).
- **Smoking** was self-reported and defined by ever smoking or not.
- **Heavy alcohol drinking** was self-reported and defined by men drinking 14 or more alcoholic beverages in a week and women drinking seven or more alcoholic beverages in a week.
- **Physical Inactivity** was defined by achieving less than 5,000 steps on average over the course of seven days which was recorded from the Omron HJ-321.
- **Health-Related Quality of Life (HRQoL)** was measured by the SF-36. The eight dimensions can be divided into 2 scores, the physical component summary (PCS) and mental component summary (MCS). Scores range from 0-100 and low PCS and low MCS scores are defined by having a score below 50.
- **Physical Component Summary Score (PCS)** included the dimensions of physical functioning, role limitations due to physical problems, bodily pain, and general health
- **Mental Component Summary Score (MCS)** included the dimensions of social functioning, vitality, role limitations due to emotional problems, and mental health
- **Low HRQoL** was a combination of low PCS and MCS due to the small sample size (scores <50)
- **Cardiorespiratory Fitness (CRF)** was measured by time to complete the 400-meter walk test and was stratified by sex then divided into quartiles with quartile 1 being the longest time to complete (slowest) and quartile 4 being the shortest (fastest).
- **Percent Body Fat (PBF)** was measured by Dual-Energy X-ray Absorptiometry (DXA) and was stratified by sex then divided into quartiles with quartile 1 being the lowest PBF and quartile 4 being the highest.

METHODS

Statistical Analysis: Logistic regression was used to calculate odds ratios (ORs) and 95% confidence intervals (95% CIs) of having a low overall HRQoL across CRF and PBF quartiles.

Results

Table 1. Participant Baseline Characteristics

	All (n=282)	Mean (Standard Deviation)
Age, years	74.19 (5.7)	
Male, % (n)	43 (118)	
Smoking, % (n)	32 (88)	
Heavy alcohol drinking, % (n)	5 (13)	11.42 (3.94)
Physical Inactivity (<5,000 steps), % (n)	66 (187)	3,188.57 (1,187.78)
Physical Component Summary Score (PCS) <50, % (n)	6.7 (19)	42.19 (5.52)
Mental Component Summary Score (MCS) <50, % (n)	1.4 (4)	40.56 (7.25)
Low HRQoL Score (combined PCS and MCS <50), % (n)		
PCS	7.4 (21)	67.22 (17.37)
MCS	7.4 (21)	44.98 (11.46)
Cardiorespiratory Fitness (CRF) both males and females, %(n)		
Q1 (Slowest)	28 (79)	3.59 (.75)
Q2	21 (58)	4.16 (.08)
Q3	22 (63)	4.54 (.12)
Q4 (Fastest)	29 (81)	5.69 (1.06)
Percent Body Fat (PBF) both males and females, %(n)		
Q1 (Lowest PBF)	30 (85)	30.60 (8.07)
Q2	25 (69)	38.78 (5.17)
Q3	20 (56)	41.52 (5.25)
Q4 (Highest PBF)	26 (72)	46.33 (5.34)

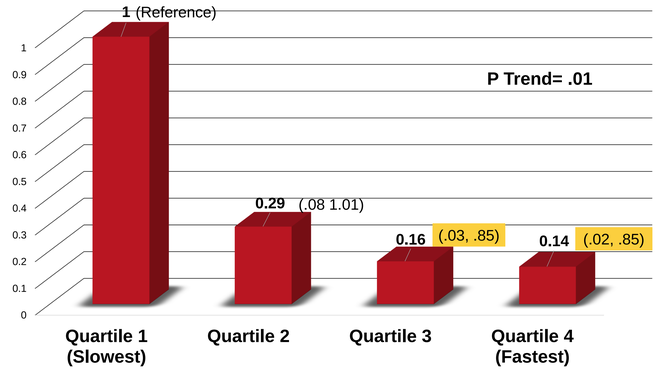
Values are means (SD) for continuous variables or % for categorical variables

Table 2. Odds Ratios of Having a Low HRQoL Categorized by Cardiorespiratory Fitness and Percent Body Fat

	Model 1[a]	Model 2[b]
Cardiorespiratory Fitness		
Q1 (Slowest)	1.00 (Reference)	1.00 (Reference)
Q2	0.32 (0.09, 1.09)	0.29 (0.08 1.01)
Q3	**0.19 (0.04, 0.95)**	**0.16 (0.03, 0.85)**
Q4 (Fastest)	0.20 (0.04, 1.09)	**0.14 (0.02, 0.85)**
P Trend	0.02	.01
Percent Body Fat		
Q4 (Highest PBF)	1.00 (Reference)	1.00 (Reference)
Q1	0.61 (0.19, 1.90)	0.71 (0.21, 2.37)
Q2	0.31 (0.07, 1.30)	0.38 (0.09, 1.67)
Q3	0.39 (0.09, 1.00)	0.51 (0.11, 2.30)
PTrend	0.10	0.24

[a]Adjusted for physical inactivity (based on <5000steps), sex (males), age, smoking (ever smoked), and heavy drinking
[b]Adjusted for model 1 plus percent body fat for CRF or cardiorespiratory fitness for PBF

Figure 1. Odds Ratios of Having a Low HRQoL Categorized by Cardiorespiratory Fitness*



*Adjusted for physical inactivity (based on <5000steps), sex (males), age, smoking (ever smoked), heavy drinking, and PBF

CONCLUSIONS

Higher CRF, independent of PBF was associated with **better overall HRQoL** in older adults.

PBF was not significantly associated with overall HRQoL after adjusting for confounding variables including CRF.

*** Limitation:** This is a cross-sectional study, thus prospective studies are needed.

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