Associations of Total and Aerobic Steps with Health-Related Quality of Life in Older Adults

Xiangyu Zhai[1,2], Joey M. Saavedra[1], Franchesca J. Porter[1], Taline R. Jouzi[1], Duck-chul Lee, FACSM[1]

[1] Iowa State University, Ames, IA

[2] The University of Hong Kong, Hong Kong, China

PURPOSE

Data on the associations of total daily steps with a health-related quality of life (HRQoL) in older adults are limited. We examined the associations of objectively measured total and aerobic (≥60 steps/min with ≥10 min continuous walking) steps with HRQoL in older adults.

METHODS

Participants

831 older adults aged ≥ 65 years

Exposure

Average daily steps over 7 days were assessed with tri-axial accelerometer-based pedometers.

Outcome

HRQoL, including physical component summary (PCS) and mental component summary (MCS) scores, was evaluated using SF-36. PCS and MCS scores <50 were defined as low physical and mental HRQoL.

Statistical Analysis

Participants were classified into tertiles of total steps/day (low, middle, and high) and 3 categories of aerobic steps/day (no [0 aerobic steps], low [lower 50%], and high [upper 50%]).

Multivariable logistic regression was used to estimate the odds ratios (ORs) and 95% confidence intervals (CIs) of low physical and mental HRQoL across the step categories after adjusting for age, sex, body mass index, smoking status, heavy alcohol drinking, education, marital status, and number of comorbidities (arthritis, hypertension, asthma, diabetes, cardiovascular disease, chronic kidney disease, chronic obstructive pulmonary disease, and cancer).

CONCLUSIONS

This study suggests that higher total and aerobic steps were associated with lower prevalences of low physical HRQoL, but only total steps were associated with a lower prevalence of low mental HRQoL in older adults. However, prospective studies are warranted.

RESULTS

Table 1. Participant characteristics

Characteristic	Total n=831	Male n=341	Female n=490
Age, mean (SD)	72.3 (6.01)	72.4 (5.82)	72.2 (6.14)
BMI, mean (SD)	27.5 (4.92)	28.5 (4.24)	26.8 (5.24)
Underweight (<18.5)	5 (0.6%)	0 (0%)	5 (1.0%)
Normal (18.5-24.9)	279 (33.6%)	68 (19.9%)	211 (43.1%)
Overweight (25.0-29.9)	329 (39.6%)	160 (46.9%)	169 (34.5%)
Obesity (>30)	218 (26.2%)	113 (33.1%)	105 (21.4%)
Smoking status, n (%)			
Never	587 (70.6%)	218 (63.9%)	369 (75.3%)
Previous	236 (28.4%)	119 (34.9%)	117 (23.9%)
Current	8 (1.0%)	4 (1.2%)	4 (0.8%)
Heavy alcohol drinking, n (%)[a]	65 (7.8%)	16 (4.7%)	49 (10.0%)
Education level			
Elementary or Jr.High	1 (0.1%)	0 (0%)	1 (0.2%)
High School	107 (12.9%)	34 (10.0%)	73 (14.9%)
Associate Degree	154 (18.5%)	49 (14.4%)	105 (21.4%)
Bachelor's degree	301 (36.2%)	136 (39.9%)	165 (33.7%)
Graduate School/Professional Degree	268 (32.3%)	122 (35.8%)	146 (29.8%)
Marital status, n (%)			
Single	36 (4.3%)	14 (4.1%)	22 (4.5%)
Married	626 (75.3%)	299 (87.7%)	327 (66.7%)
Widowed	105 (12.6%)	16 (4.7%)	89 (18.2%)
Divorced	64 (7.7%)	12 (3.5%)	52 (10.6%)
Step counts per day, mean (SD)[b]	5633 (3171)	5914 (3338)	5436 (3037)
Aerobic steps per day, mean (SD)[c]	1617 (2176)	1714 (2208)	1549 (2154)
PCS, mean (SD)	83.9 (13.3)	84.5 (13.1)	83.5 (13.5)
MCS, mean (SD)	84.0 (10.9)	84.6 (10.5)	83.6 (11.3)
Comorbidities, number[d]	1.32 (1.04)	1.44 (1.06)	1.23 (1.02)

Continuous data presented as mean ± standard deviation, categorical data presented as count (%).

[a] >7 alcoholic drinks/week for women, >14 alcoholic drinks/week for men.

[b] average steps per day from days with at least 10 h of wear time on at least 4 days of the week;

[c] steps taken during continuous walking of at least 10 min at a pace of ≥60 steps/min, and the mean (SD) of aerobic steps per day were calculated in participants who had aerobic steps;

[d] sum of comorbidities present.

Fig 1. Odds ratios [95% CIs] for having a low PCS and MCS by total steps

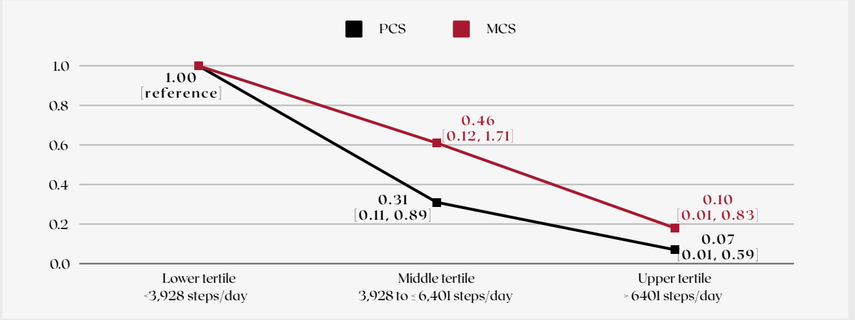
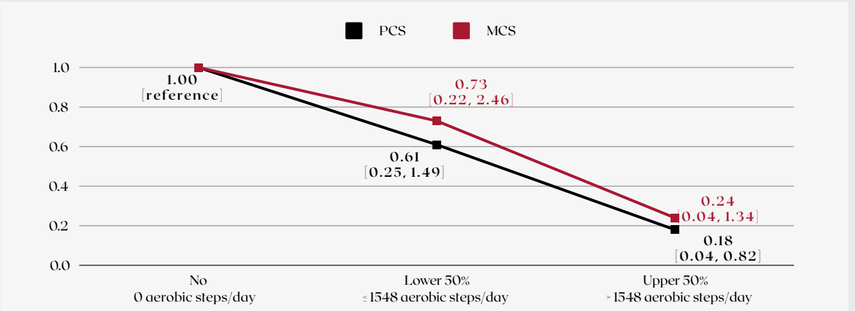


Fig 2. Odds ratios [95% CIs] for having a low PCS and MCS by aerobic steps



KEY MESSAGE

Achieving **higher total daily steps** or **higher aerobic steps** may have favorable implications for the **quality of life** in older adults.