Associations of Resistance and Aerobic Exercise with Recommended Sleep Duration in Older Adults

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Introduction

- Sleep is associated with chronic disease prevention and longevity.
- Physical activity and exercise have been shown to be associated with sleep.
- Studies on which type of exercise is more strongly associated with sleep have shown inconsistent results.
- Most earlier studies used self-reported sleep, but more studies from objective sleep assessment are required.

Purpose

- To investigate independent associations of resistance exercise (RE) and aerobic exercise (AE) with recommended sleep duration.
- To examine difference in these associations based on device-based (objective) vs. self-reported (subjective) sleep measurement.

Methods

Study Population

- We used data from the Physical Activity and Aging Study (PAAS), a prospective cohort of relatively healthy older adults aged ≥65 years.
- This study included 840 older adults (female=58%, mean age=71.7 years).

Assessments

- Exercise was evaluated by physical activity questionnaire and categorized into 3 groups as 0 day, 1day, and ≥ 2days per week for RE and 0-499, 500-999, and ≥ 1,000 MET-min/week for AE.
- Sleep was assessed by both the Pittsburgh Sleep Quality Index (PSQI) and Fitbit Charge2, and the recommended sleep duration was defined as 7-8 hours/day.

Statistical Analysis

- Logistic regression was used to calculate the odds ratios and 95% confidence intervals for the association of RE or AE with the recommended sleep duration.
- Covariates include age, sex, education, race, employment status, body mass index, heavy alcohol drinking, smoking status, marital status, and RE for AE and AE for RE.

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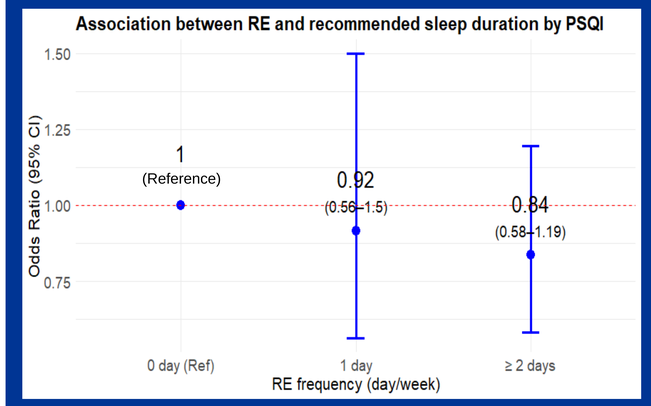
A



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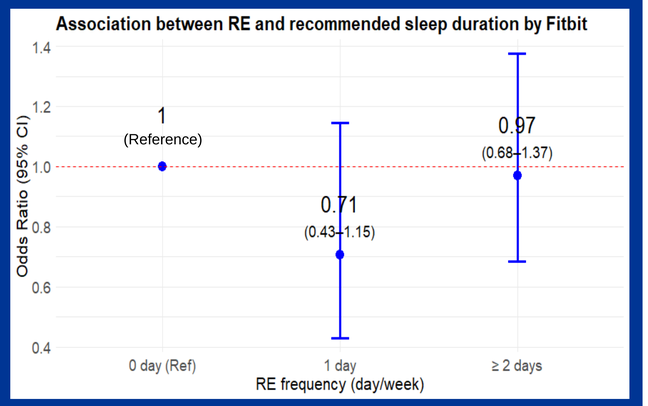

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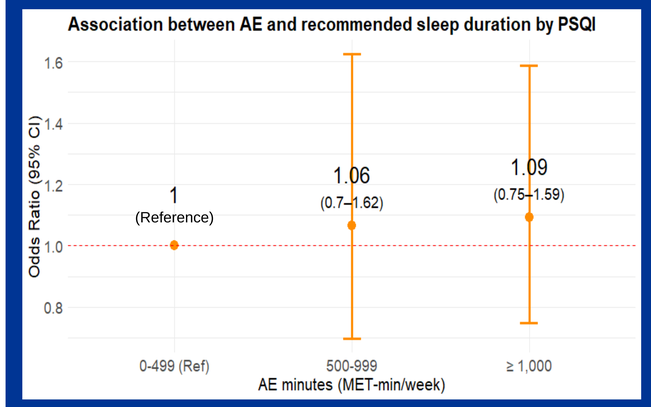

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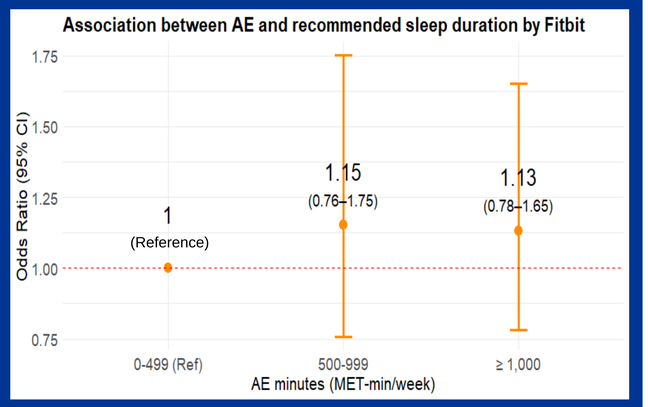

Figure 1 Associations of resistance exercise (RE) or aerobic exercise (AE) with meeting the recommended sleep duration (7-8 hours/day), measured via self-report (PSQI) vs. wearable device (Fitbit). Models were adjusted for age, sex, education, race, employment status, body mass index, heavy alcohol drinking, smoking status, marital status, and RE for AE and AE for RE. PSQI, The Pittsburgh Sleep Quality Index.

Which types of exercise are associated with **sleep duration**?

Results

Table Odds ratios (OR) of Meeting sleep duration recommendation based on PSQI and Fitbit according to combined weekly MET-min of Aerobic exercise (AE) and weekly frequency Resistance exercise (RE) among participants in PAAS

	AE (MET-min/week)	No. of cases	Model 1*	Model 2†
PSQI				
Resistance Exercise				
0 day	0-499	64	1 (Ref)	1 (Ref)
	500-999	32	0.63 (0.30-1.31)	0.66 (0.31-1.38)
	≥1,000	52	1.16 (0.57-2.41)	**1.18** (0.57-2.48)
1 day	0-499	21	0.75 (0.32-1.81)	0.76 (0.32-1.85)
	500-999	34	1.68 (0.71-4.35)	**1.68** (0.70-4.38)
	≥1,000	30	0.61 (0.29-1.27)	0.59 (0.28-1.25)
≥2 days	0-499	52	0.67 (0.35-1.29)	0.70 (0.36-1.33)
	500-999	77	0.79 (0.43-1.44)	0.79 (0.73-1.46)
	≥1,000	206	0.83 (0.48-1.38)	0.86 (0.50-1.45)
	P for trend		0.44	0.51
Fitbit				
Resistance Exercise				
0 day	0-499	31	1 (Ref)	1 (Ref)
	500-999	19	1.08 (0.53-2.21)	**1.12** (0.53-2.32)
	≥1,000	26	1.27 (0.66-2.46)	**1.19** (0.61-2.34)
1 day	0-499	7	0.54 (0.19-1.33)	0.54 (0.19-1.35)
	500-999	15	1.09 (0.50-2.34)	**1.01** (0.45-2.22)
	≥1,000	16	0.84 (0.40-1.75)	0.75 (0.35-1.59)
≥2 days	0-499	29	1.02 (0.54-1.91)	**1.03** (0.54-1.95)
	500-999	43	1.13 (0.63-2.02)	**1.06** (0.59-1.93)
	≥1,000	106	1.10 (0.67-1.82)	**1.07** (0.64-1.79)
	P for trend		0.72	0.81

Note: Data are presented as OR (95% CI)
*Adjusted for age, and, sex.
†Adjusted for model 1 plus education, race, work status, body mass index category, heavy alcohol drinking, smoking status, and marital status.

Different proportions of people meeting the sleep duration guideline according to self-report (PSQI) vs. Fitbit

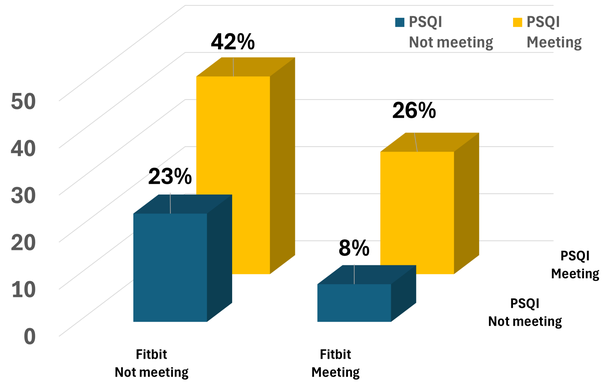

Figure 2 Meeting the recommended sleep duration by subjective (self-reported) and objective (device-based) measures

Conclusion

- This study suggests that the percentage of older adults meeting the recommended 7-8 hours/night of sleep was nearly half by device-based measures (35%) compared to self-report (68%).
- We observed no significant associations of RE and AE with the recommended sleep duration using both subjectively and objectively measured sleep duration, in part due to self-reported exercise, in this relatively healthy older adult population.
- Prospective studies are needed.