



Physical Activity and Sleep Quality Effects on Stress and Depression Across the Lifespan

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Objective

Examine the relationship of physical activity and sleep to depression and stress in a large sample of adults from the Human Connectome Project – Aging (HCP-A) and the Adult Aging Brain Connectome (AABC) studies.

Introduction

- Physical activity and sleep can influence mood in older adults^{1,2} and play a role in preventing cognitive decline.³
- Sleep and physical activity may impact mood differently across the lifespan potentially affecting cognitive abilities.

Materials & Methods

- Participants: N = 180. Age: 66.6 years (SD =13.4, range 40-95 years). 51% female.
- Participants completed baseline measures including:
 - Physical Activity: International Physical Activity Questionnaire (IPAQ). Physical activity was measured in metabolic equivalent of task (MET).
 - Sleep Quality: Pittsburgh Sleep Quality Index (PSQI)
 - Depression: Center for Epidemiological Studies-Depression (CES-D)
 - Stress: Ongoing Chronic Stressors Scale (OCSS)
- The following analyses were completed:
 - General linear models with sleep (PSQI) and physical activity (IPAQ) as independent variables and stress (OCSS) and depression (CES-D) as dependent variables.
 - Age as a factor with 2 levels: <65 years and ≥65 years.

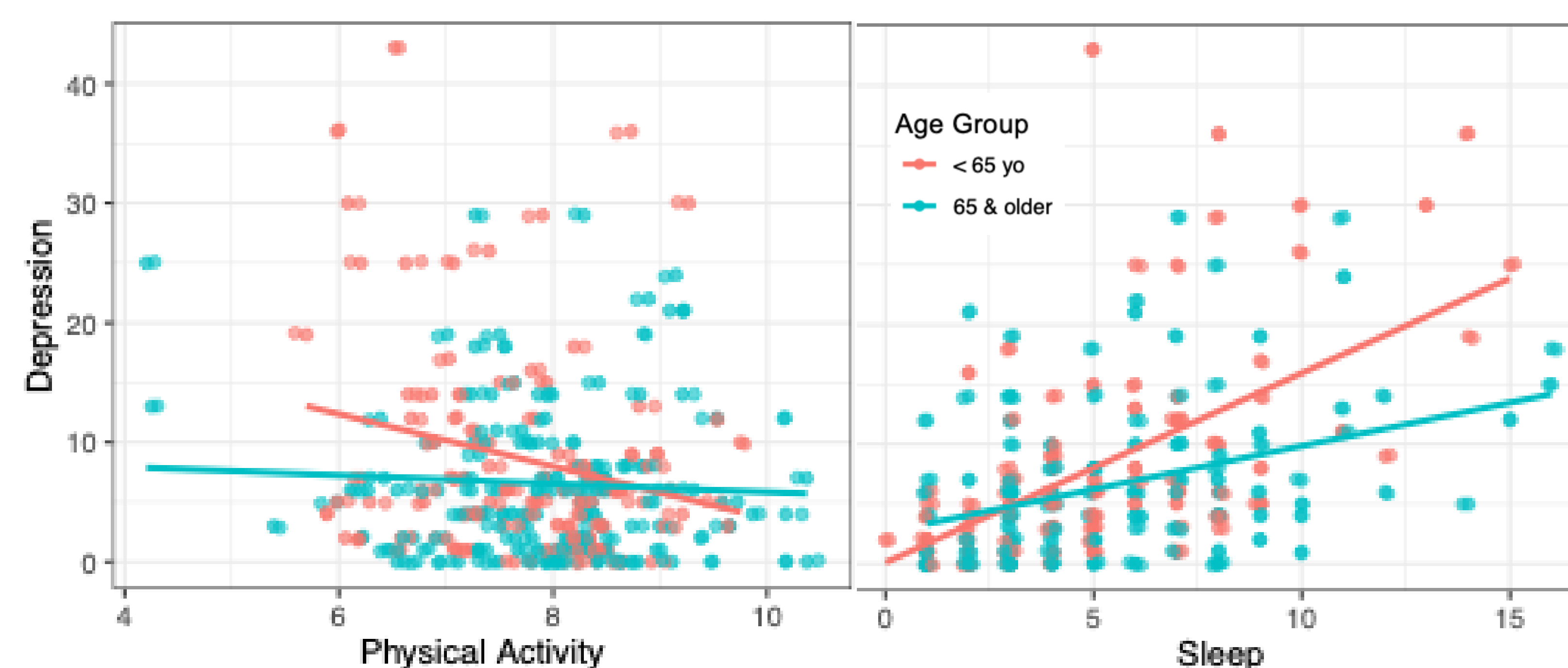
Physical activity and sleep are associated with depression and stress differentially across the lifespan with *stronger relationships in younger than older adults*.

Table 1: Baseline measures of participants (n=180)

Means (SDs)	Depression (CESD)	Stress (OCSS)*	Sleep (PSQI)	Phys. Activity (log(IPAQ_MET))
<65 yo	8.6 (9.03)	11.87 (4.02)	5.36 (3.17)	7.74 (0.96)
65 & older	6.6 (6.62)	10.57 (2.3)	5.5 (3.32)	7.96 (1.09)

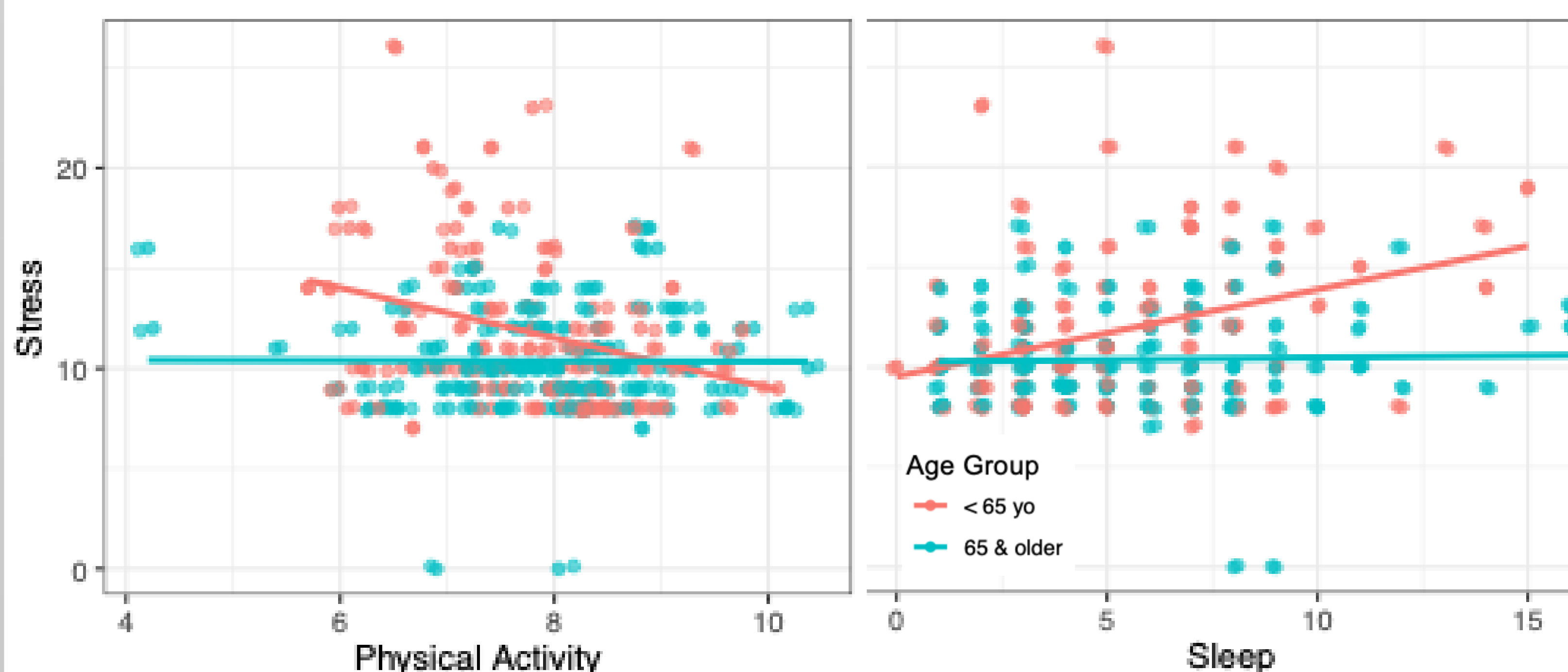
*Statistically significant at P<0.01

Graph 1: Physical activity and sleep quality are more strongly related to depression in the younger than older group



Note: PSQI total scores are reverse coded: higher values = worse sleep quality

Graph 2: Physical activity and sleep quality are related to stress in the younger but not older group



Results

Depression:

- Age group-by-physical activity interaction – F(1,156) = 5.41, p = 0.02
Younger group: $\beta = -2.3$, p = .001; Older group: $\beta = 0.2$, p = 0.8
- Age group-by-sleep quality interaction – F(1,156) = 4.29, p = 0.04
Younger group: $\beta = 1.3$, p < .0001; Older group: $\beta = 0.6$, p = 0.002

Stress:

- Age group-by-physical activity interaction – F(1, 156) = 6.09, p = 0.01
Younger group: $\beta = -1.3$, p = .0007; Older group $\beta = -0.1$, p = 0.7
- Age group-by-sleep quality interaction – F(1, 156) = 3.16, p = 0.07 – approaching sig.
Younger group: $\beta = 0.3$, p = .01; Older group: $\beta = 0.03$, p = 0.7

Conclusions

- Findings illustrate an age-related difference in how physical activity and sleep quality affect mental health.
- Among younger individuals (<65 years), poorer sleep quality and reduced physical activity were linked to higher levels of depression and stress.
- Findings support the hypothesis that older adults have stronger emotion regulation skills, which provide resilience to changes in sleep and physical activity.
- Future analyses will investigate how sleep and physical activity may act as protective factors to help prevent cognitive decline.

References

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