Physical and Mental Activity, Disease Susceptibility, and Risk of Dementia

A Prospective Cohort Study Based on UK Biobank

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Cite as: Neurology® 2022;99:e799-e813. doi:10.1212/WNL.0000000000200701

Study Question
Are physical and mental activity patterns associated with the risk of dementia, and can such an association be modified by genetic or familial susceptibility to dementia?

What Is Known and What This Paper Adds
Accumulating evidence suggests a role of physical and mental activity in maintaining cognitive capacity and preventing dementia. The results of this study show that frequent engagement in exercise, housework-related activity, and friend of family visit is associated with a reduced risk of multiple types of dementia and that the association was independent of polygenetic risk score, APOE genotype, or family history of dementia.

Methods
In this prospective cohort study of the UK Biobank, 501,376 dementia-free participants were recruited in 2006–2010 and followed from 1 year after the recruitment until the end of 2019 for ascertainment of dementia. Cox models were used to estimate the associations of physical (i.e., physical activity at leisure time, housework-related activity, and transportation) and mental (i.e., intelligence, social contact, and use of electronic device) activity-related items, as well as the major patterns identified by principal component analysis, with the risk of dementia, adjusted for multiple confounders. The modification role of disease susceptibility on such associations was assessed through stratified analyses by the polygenic risk score (PRS) of dementia generated based on summary statistics of independent genome-wide association studies, by APOE genotype, and by self-reported family history of dementia.

Results and Study Limitations
The mean age at recruitment was 56.53 years, and 45.60% of the participants were male. During a mean follow-up of 10.66 years, 5,185 dementia cases were identified. When analyzed separately, most studied activity items showed significant associations with the risk of dementia. The pattern analyses revealed that a higher level of adherence to activity patterns related to frequent vigorous and other exercises (hazard ratio [HR] 0.65; 95% CI 0.59–0.71), housework-related activity (HR 0.79; 95% CI 0.72–0.85), and friend/family visit (HR 0.85; 95% CI 0.75–0.96) was associated with a lower risk of dementia. We obtained comparable results for vascular dementia and Alzheimer disease as well as in the stratified analyses by PRS for dementia, APOE genotype, or family history of dementia. Study limitations include the self-report data on activities, unsatisfactory accuracy of dementia subtype diagnoses, and the nonrepresentativeness of the UK Biobank population.

Study Funding and Competing Interests
This work was funded by the National Natural Science Foundation of China, and West China Hospital, Sichuan University. The authors report no competing interests. Go to Neurology.org/N for full disclosures.
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Neurology 2022;99:e799-e813 Published Online before print July 27, 2022
DOI 10.1212/WNL.0000000000200701

This information is current as of July 27, 2022

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