DUKE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY & NEUROSCIENCE

TITLE: Mental health problems are linked with faster aging in middle age

A research team led by Jasmin Wertz, Avshalom Caspi and Terrie Moffitt at Duke University reports that experiencing mental health problems is linked with faster aging in middle age. The findings are based on a study that followed a birth cohort of 1037 children, born in the early 1970s and followed to age 45 years. Study participants' mental health problems were measured every few years from age 18 to age 45. Mental health problems included problems such as anxiety, depression, substance abuse, and schizophrenia. Indicators of faster aging were measured at age 45. Indicators included the biological age of participants' bodies; participants' sensory, motor and cognitive functioning; and ratings of how old participants looked. The findings suggest that prevention of mental health problems and monitoring of individuals with mental health problems for signs of accelerated aging may reduce health inequalities, extend healthy lives and reduce healthcare costs.

FINDINGS:
Recent work by our team (published here) reports that young individuals with mental disorders were more likely to develop subsequent physical diseases, accounted for excess health-care dollars and tended to die earlier than people without mental disorders. Here we add to this work by testing whether mental health problems are also linked with processes of faster aging that precede the onset of age-related physical disease. We studied a cohort of 1037 individuals who were born in 1972-73 and followed up until they were 45 years old. We observed four main findings:

(1) At age 45, study participants who had previously experienced more mental health problems were aging at a faster pace, had greater declines in sensory, motor and cognitive function, and were rated as looking older than their peers.

(2) Mental health problems were linked with aging outcomes even when evaluated against a baseline of poor health in childhood. For example, individuals with more mental health problems had slower gait speed at midlife, even after controlling for pre-existing childhood motor difficulties, and they performed more poorly on tests of cognition, even after controlling for pre-existing childhood cognitive abilities (i.e., they experienced greater child-to-midlife cognitive decline, not just low cognitive functioning present since childhood).

(3) The pattern of findings held even after the data were controlled for health factors such as overweight, smoking, medications and prior physical disease.

(4) Links between mental health problems and aging were not specific to any one type of problem but were evident across problems, including externalizing problems (such as ADHD or substance abuse), internalizing problems (such as depression or anxiety) and thought disorders (such as schizophrenia).

WHY ARE THESE FINDINGS IMPORTANT?

1. Experiencing mental health problems is linked with faster aging already by middle age.

2. Preventing mental health problems has the potential to slow aging and delay age-related disease, because mental health problems tend to develop years before physical diseases.

2. Individuals with mental disorders are a high-priority group to monitor for signs of accelerated aging-- such as hearing impairment, motor problems, and cognitive decline--that may become apparent earlier in this group than in the general population. Such monitoring will require greater integration of mental and physical health services.

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UNIVERSITIES INVOLVED:
Duke University, USA; King's College London, United Kingdom; University of Michigan, USA; University of Otago, New Zealand;

SUPPORTING DETAILS:
Participants: Participants were members of the Dunedin Longitudinal Study, an investigation of health and behavior in a representative birth cohort. The 1,037 participants were all individuals born between April 1972 and March 1973 in Dunedin, New Zealand. This birth cohort's childhood families represented the full range of socioeconomic status in the general population. Follow-ups have been carried out at ages 3, 5, 7, 9, 11, 13, 15, 18, 21, 26, 32, 38, and most recently 45, when 94% of the living cohort members took part.

Measuring mental health problems: Mental health problems (such as anxiety, depression, substance abuse, and schizophrenia) were assessed in six diagnostic assessments from age 18 to age 45. Symptom scores were summarized into a continuous measure called 'p-factor' that captures how study participants differ from each other in the variety and persistence of many different kinds of mental health problem symptoms from age 18 to 45 years.

Measuring accelerated aging: Accelerated aging was assessed by three sets of measures: Pace of Aging; Sensory/Motor/Cognitive functioning; and Facial Aging.

> (1) Pace of Aging was measured for each participant with repeated assessments of a panel of 19 biomarkers taken at ages 26, 32, 38, and 45 years. The 19 biomarkers were: body mass index, waist-hip ratio, glycated hemoglobin (HbA1C), leptin, blood pressure (mean arterial pressure),

cardiorespiratory fitness (VO$_2$Max), forced expiratory volume in one second (FEV$_1$), FEV$_1$ to forced vital capacity ratio (FEV$_1$/FVC), total cholesterol, triglycerides, high-density lipoprotein (HDL) cholesterol, apolipoprotein B100/A1 ratio, lipoprotein(a), creatinine clearance, urea nitrogen, C-reactive protein, white blood cell count, gum health, and caries-affected tooth surfaces. Change over time in each biomarker was modeled, and these rates of change were combined into a single Pace of Aging-index scaled in years of physiological change occurring per one chronological year.

(2) Sensory (hearing, vision, balance), motor and cognitive functioning was measured using clinical tests that gerontologists typically give to older adults (e.g., gait speed) and self-reports by study participants about limitations they may experience in everyday life (e.g., physical limitations).

(3) Facial Aging was based on ratings by an independent panel of 8 raters of photographs of each participant's face made during their age-45 assessment.