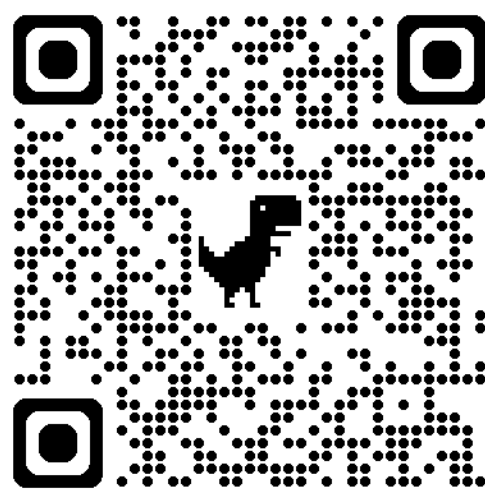


Behavioral and Psychological Symptoms of Dementia Associated with High Outdoor Temperature



Any Questions?
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- 1. Short-term outdoor heat exposure may exacerbate behavioral and psychological symptoms of dementia (BPSD) among community-living PLWD.
- 2. Sex-specific symptom patterns suggest that males and females living with dementia may express heat-related distress through different behavioral and neuropsychiatric pathways.

INTRODUCTIONMETHODSRESULTSDISCUSSION

Motivation

- Extreme heat events pose a growing threat to an estimated **45 million community-living persons living with dementia (PLWD)** worldwide.
- PLWD are especially vulnerable to heat due to **impaired thermoregulation, limited mobility, and reduced capacity** to perceive and respond to thermal stress.
- Prior studies have linked **high outdoor temperature** to **hospitalization and mortality risk** among PLWD.
- **Behavioral and psychological symptoms of dementia (BPSD)** may be an **important precursor** to these severe outcomes, yet their association with outdoor heat remains understudied.
- Given known **sex differences in BPSD profiles and physiological responses** to heat, heat-related BPSD manifestations may differ between females and males.

Study Objectives

- To examine sex-specific associations between **short-term outdoor heat** and **BPSD** among **community-dwelling PLWD** in the U.S.

Data/Sample

- U.S. Health and Retirement Study (2000-2020) linked to census-tract weather data from the Contextual Data Resource.
- Community-dwelling adults living with dementia with completed proxy-reported interviews (Male = 938; Female= 1,300).

Measures

- **BPSD**: Proxy-reported eight distinct behavioral and psychological symptoms, including affective, psychotic, and behavioral manifestations
- **Heat exposure**:
Metric Heat Index (HI; air temperature adjusted for relative humidity).
Time Window / Scale Mean HI over the 7 days preceding the interview, scaled to an interquartile range increase (61°F to 87°F).
- **Covariates**: Proxy type, proxy-rated memory, sociodemographic factors, rural residence, area-level socioeconomic conditions, cardiometabolic conditions.

Analysis

- Sex-stratified logistic regression models used to estimate associations between short-term heat exposure and BPSD, with standard errors adjusted for repeated observations within individuals.

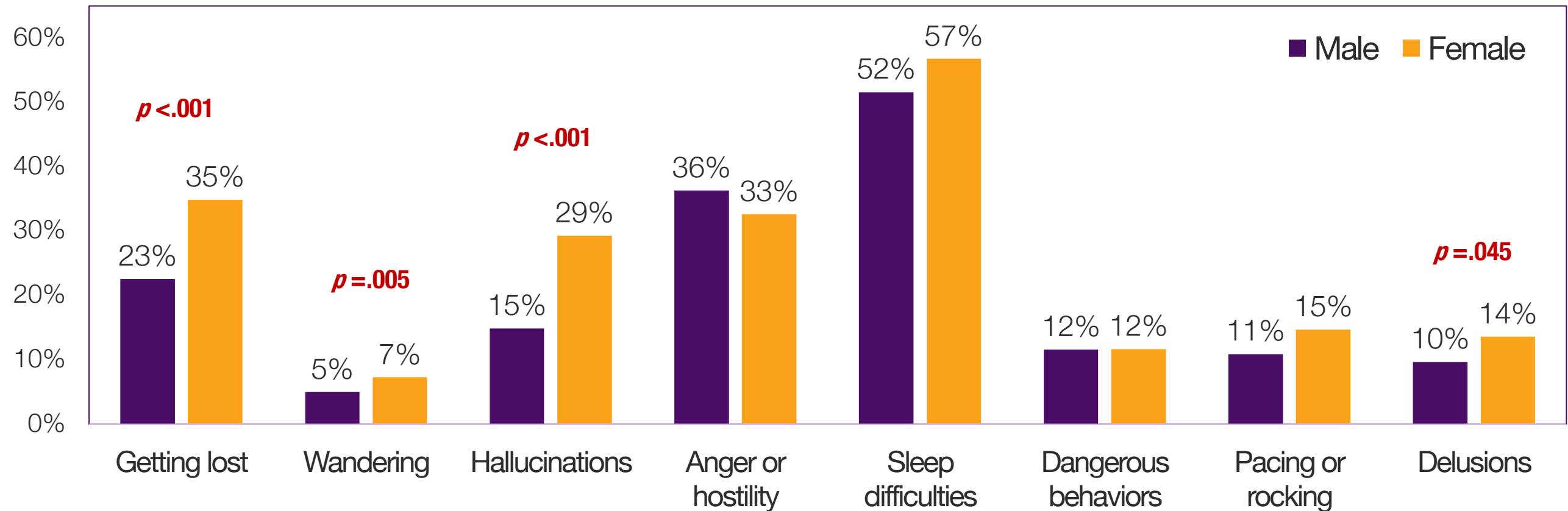


Figure 1. Prevalence of BPSD by Sex. Females are more likely than males to experience several symptoms, including getting lost, wandering, hallucinations, and delusions.

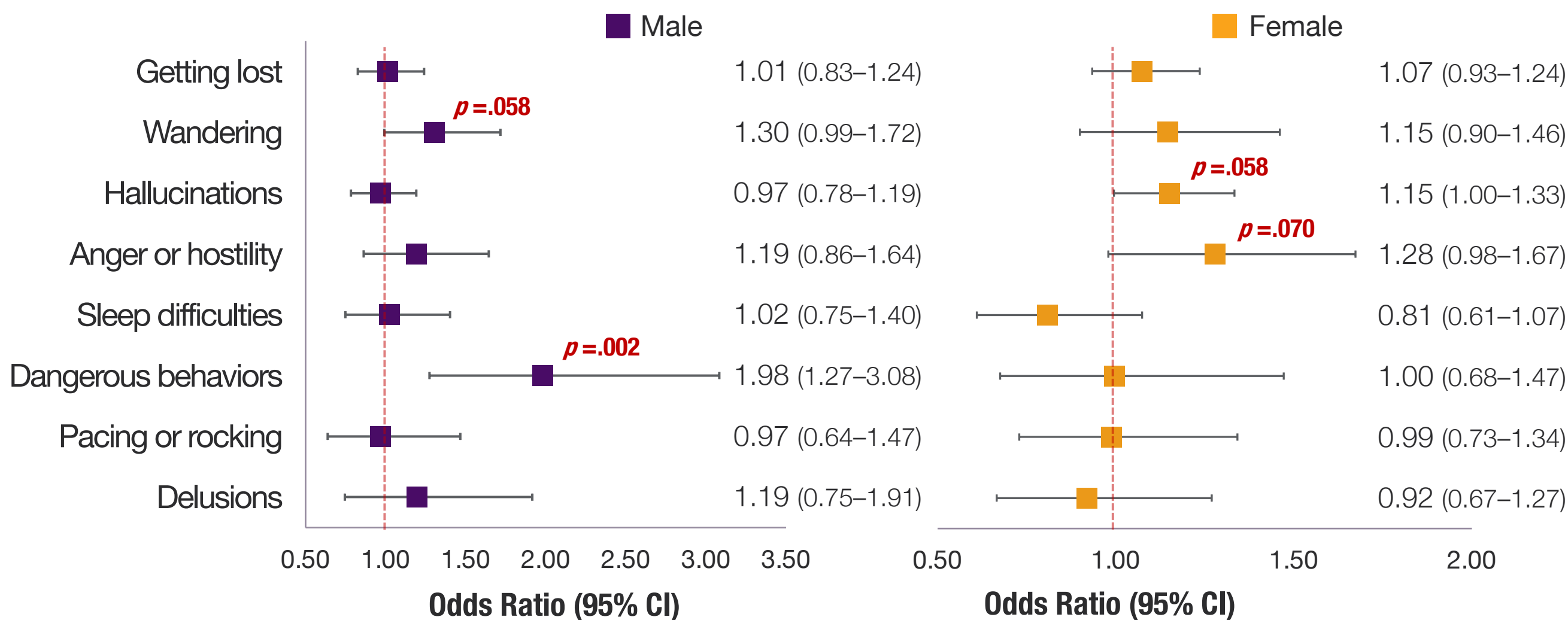


Figure 2. Short-term outdoor heat exposure and BPSD by sex. ORs represent an IQR increase in 7-day mean Heat Index (61°F to 87°F). Higher heat is associated with wandering and dangerous behaviors in males and hallucinations and anger/hostility in females.

- Among males, heat exposure was more strongly associated with **externalizing behavioral dysregulation**.
- Among females, heat exposure was more strongly associated with **neuropsychiatric and affective symptoms**.
- These patterns may reflect sex differences in **baseline vulnerability**, with frontal or executive dysfunction related to wandering and risky behaviors among males, and limbic or affective vulnerability related to hallucinations and irritability among females.
- Findings suggest a need for **sex-sensitive monitoring of BPSD** during heat events.

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