

Measuring Caregiving Stress in Real Time: Methodological Lessons from Mobile Apps and Wearables

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Measuring Daily Caregiving Stress

- 1 in 4 U.S. adults (~63m people) provide unpaid caregiving to family members, friends, and loved ones without professional training (AARP and National Alliance for Caregiving 2025)
- Negative long-term effects of caregiving on well-being (Zarit et al. 1980) and other aspects of personal and professional life (Giovannetti et al. 2009; Waligora et al. 2019) well documented
 - Much less known about caregivers' day-to-day experiences
- Mobile apps and wearable devices create new opportunities to study daily stress and health dynamics with reduced recall bias and increased temporal precision
 - Methodological challenges related to non-participation bias

UAS-Caregiving Lifecourse Experiences Assessed in Real-time (UAS-CLEAR)

Monthly UAS Surveys

Are you currently spending any time assisting someone with basic personal activities because they are unable to handle them without help?



Baseline

Caregiving experience, stress, and well-being

Quarterly Follow-up Surveys

Caregiving status, caregiving experience, well-being

7-day EMA (5 times/day)

Daily experiences, stress



Fitness Tracker

Heart rate, heart rate variability, step counts, sleep quality



2024 | 2025

Participation in UAS-CLEAR

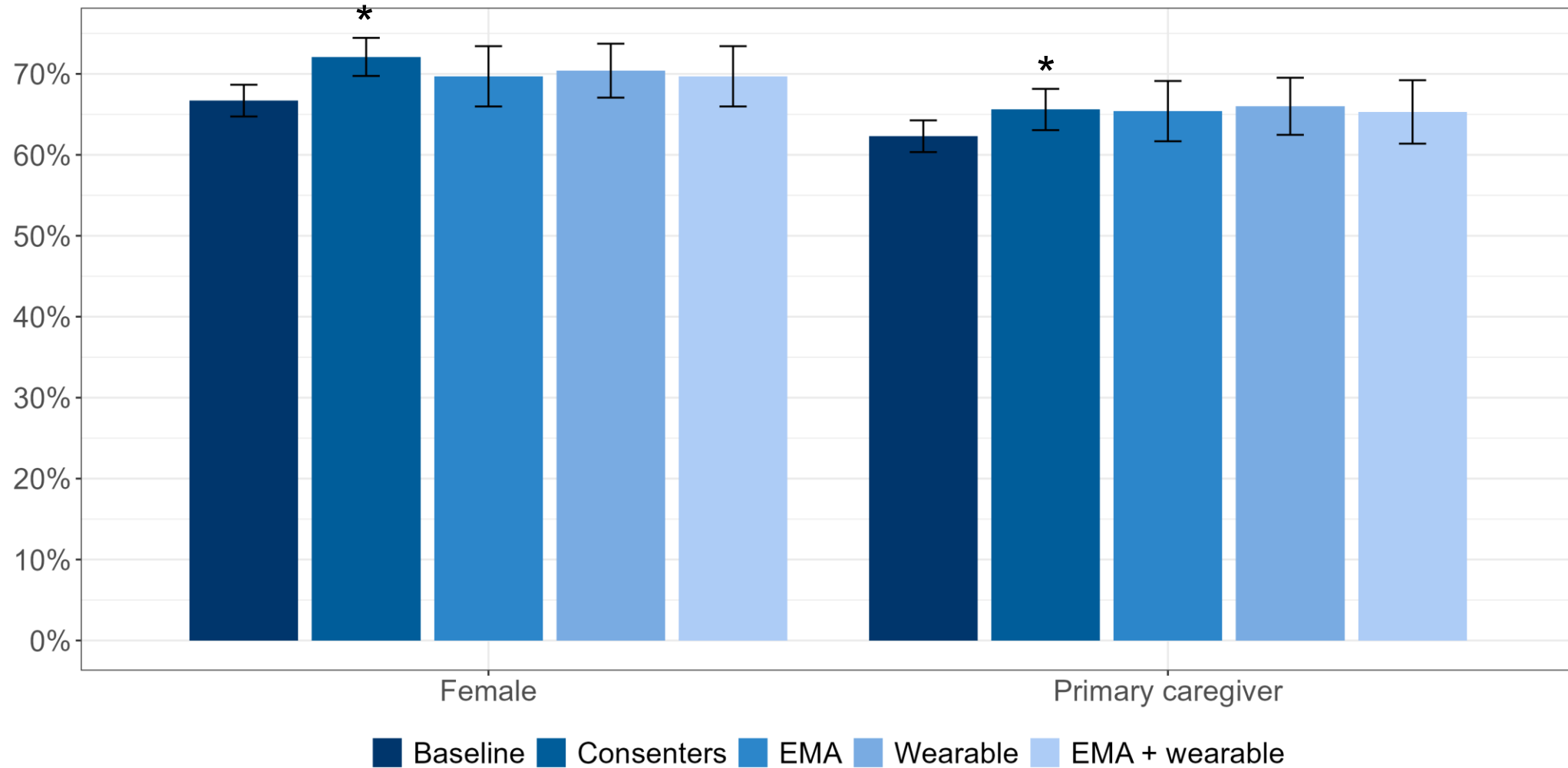
2,200 caregiving baseline participants

1,307 consent to EMA and wearable data collection

699 provide wearable data or respond to 1+ EMA
686 provide wearable data – 607 complete 1+ EMA

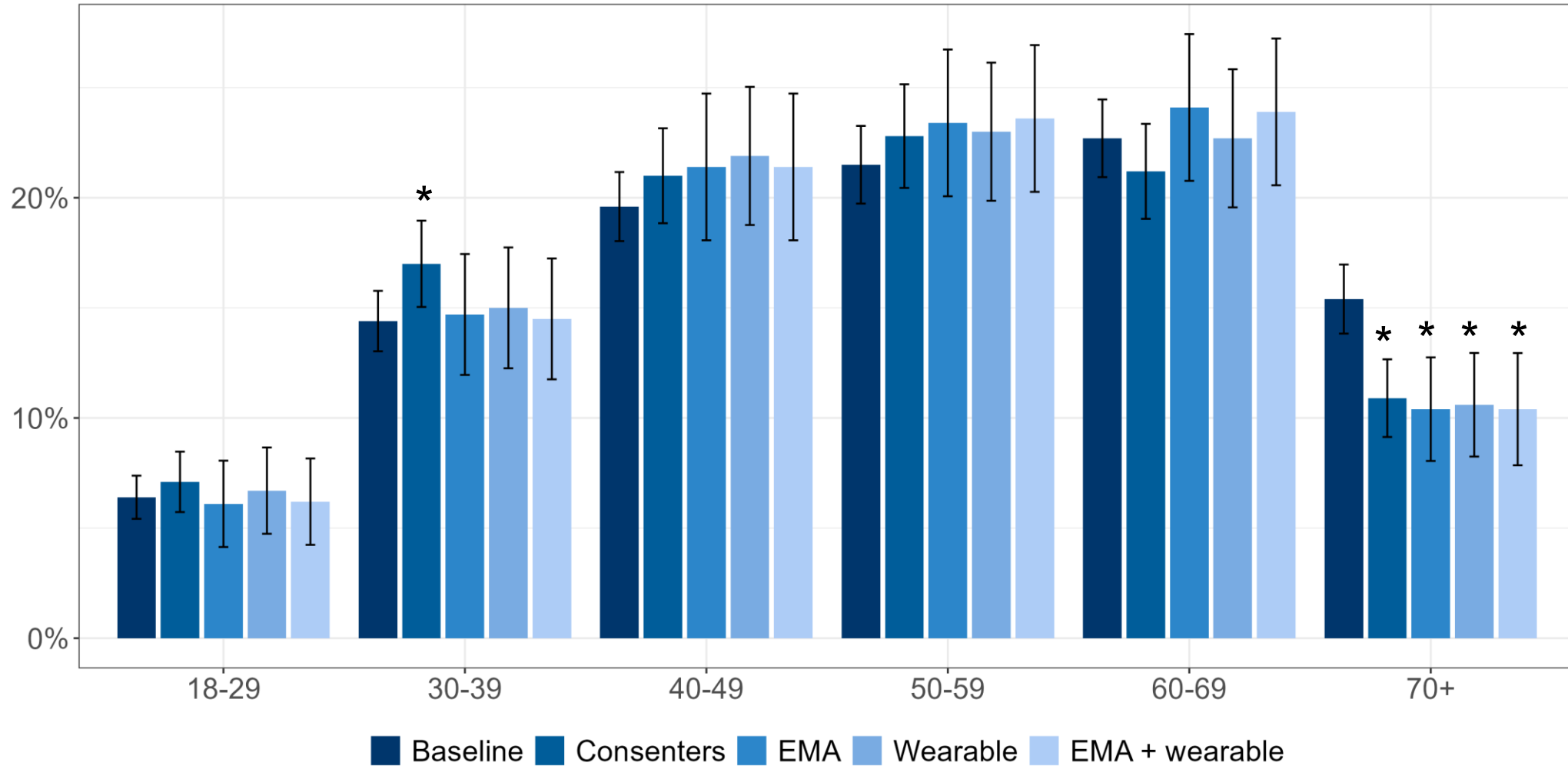
594 provide wearable data and respond to 1+ EMA

Participation Bias: Caregiver Gender & Caregiver Status



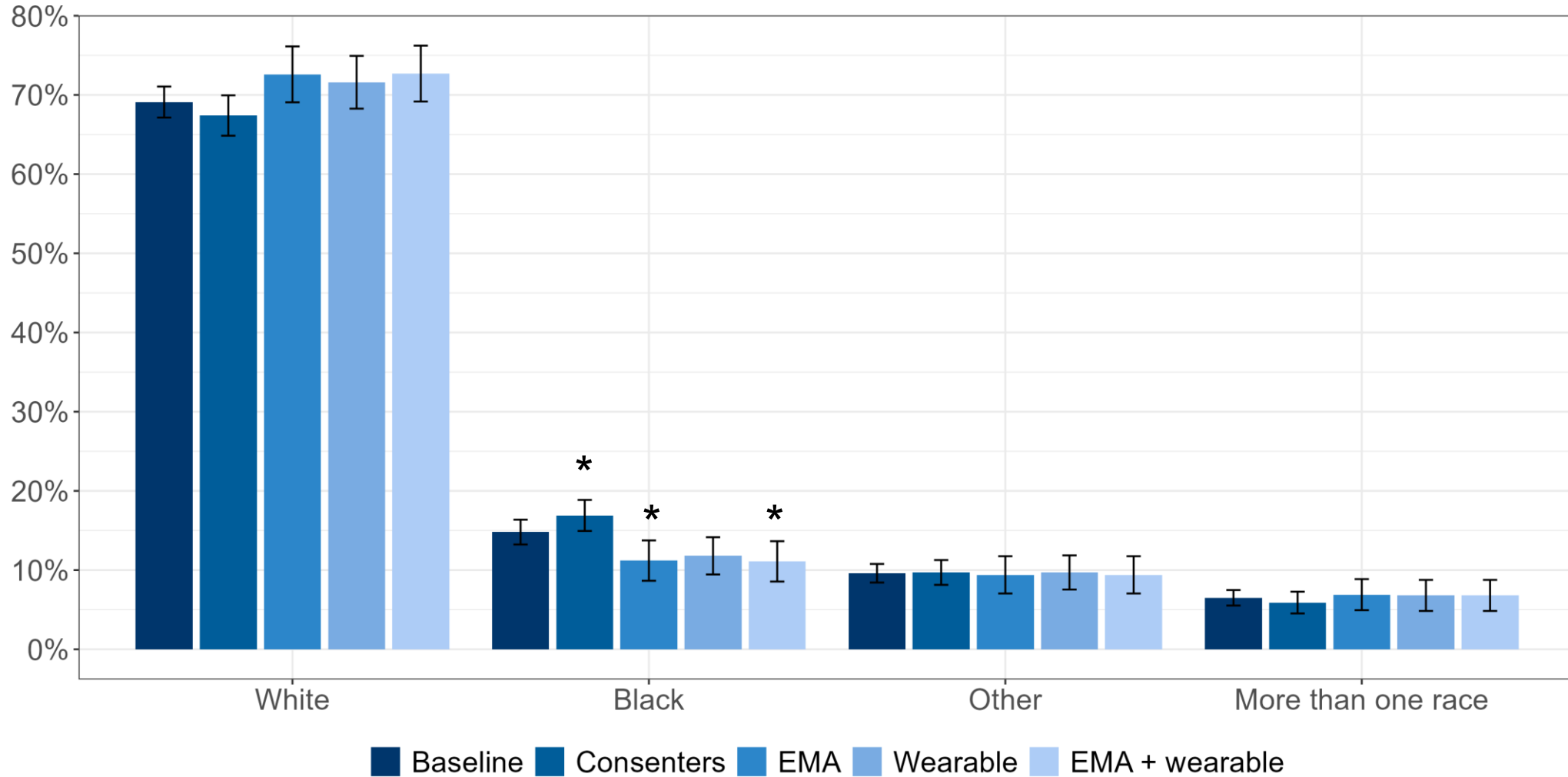
*Significant differences when comparing estimate to baseline sample ($p < 0.5$ using Benjamini-Hochberg correction for multiple testing).

Participation Bias: Caregiver Age



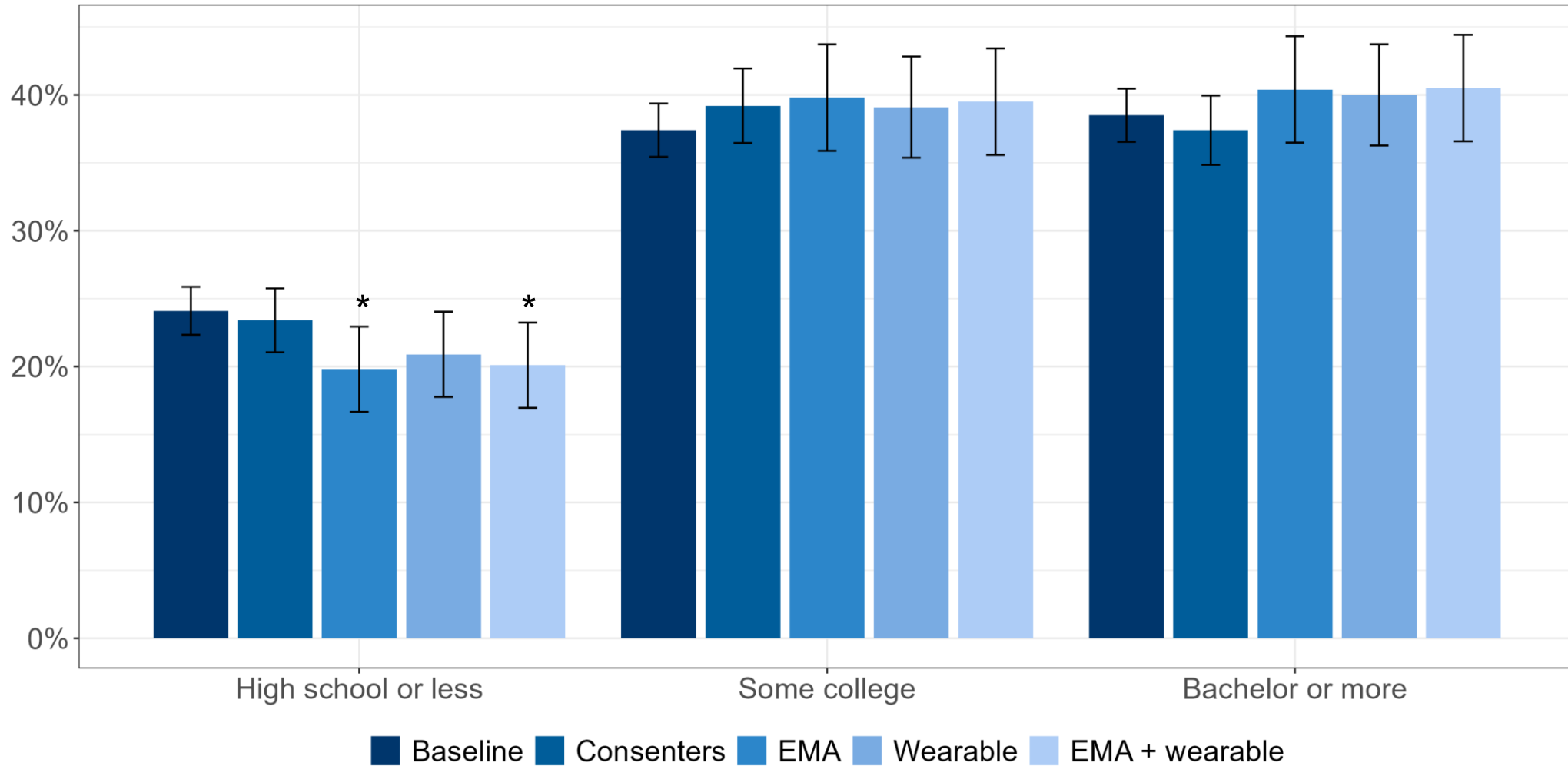
*Significant differences when comparing estimate to baseline sample ($p < 0.5$ using Benjamini-Hochberg correction for multiple testing).

Participation Bias: Caregiver Race



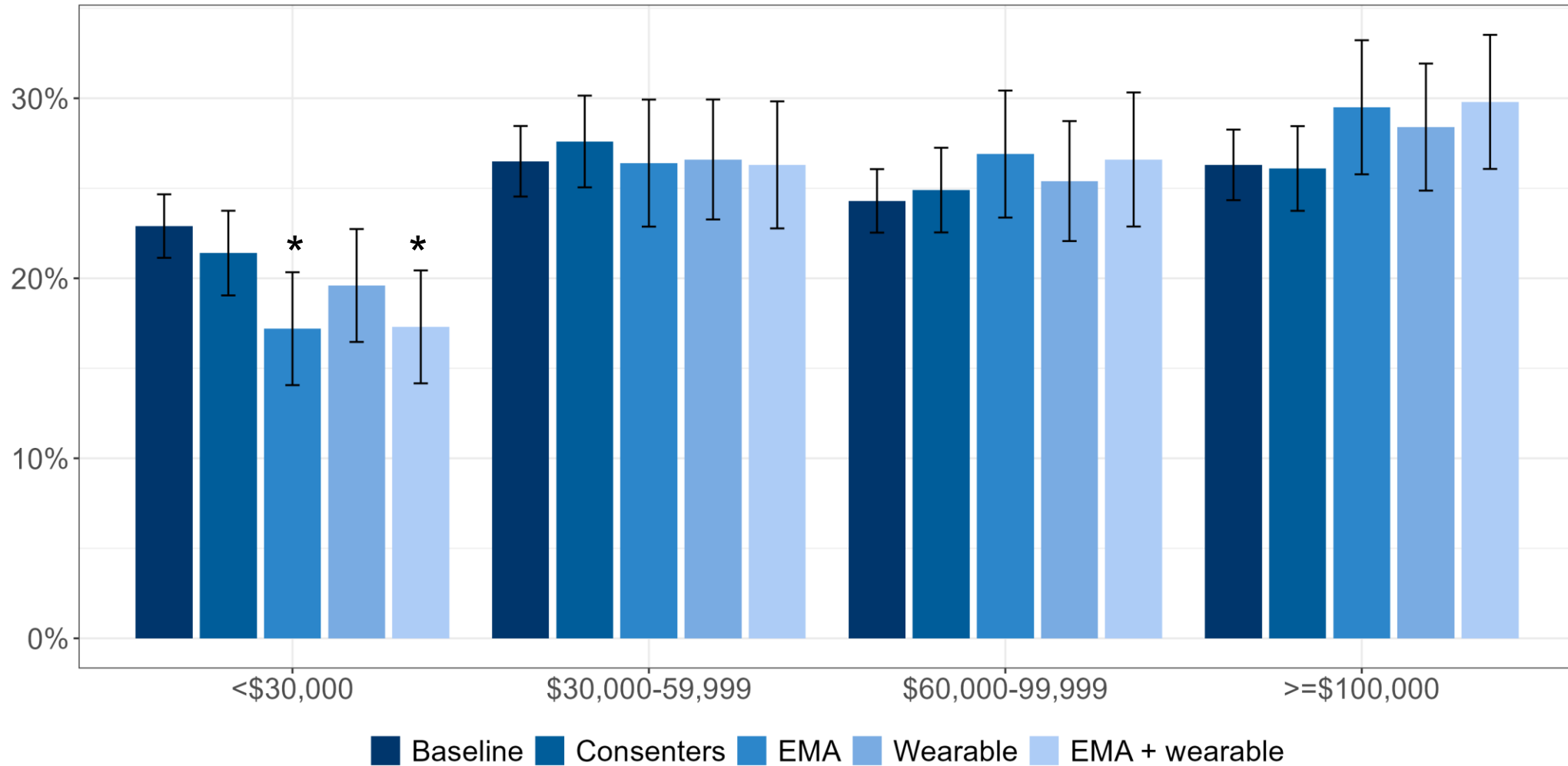
*Significant differences when comparing estimate to baseline sample ($p < 0.5$ using Benjamini-Hochberg correction for multiple testing).

Participation Bias: Caregiver Education



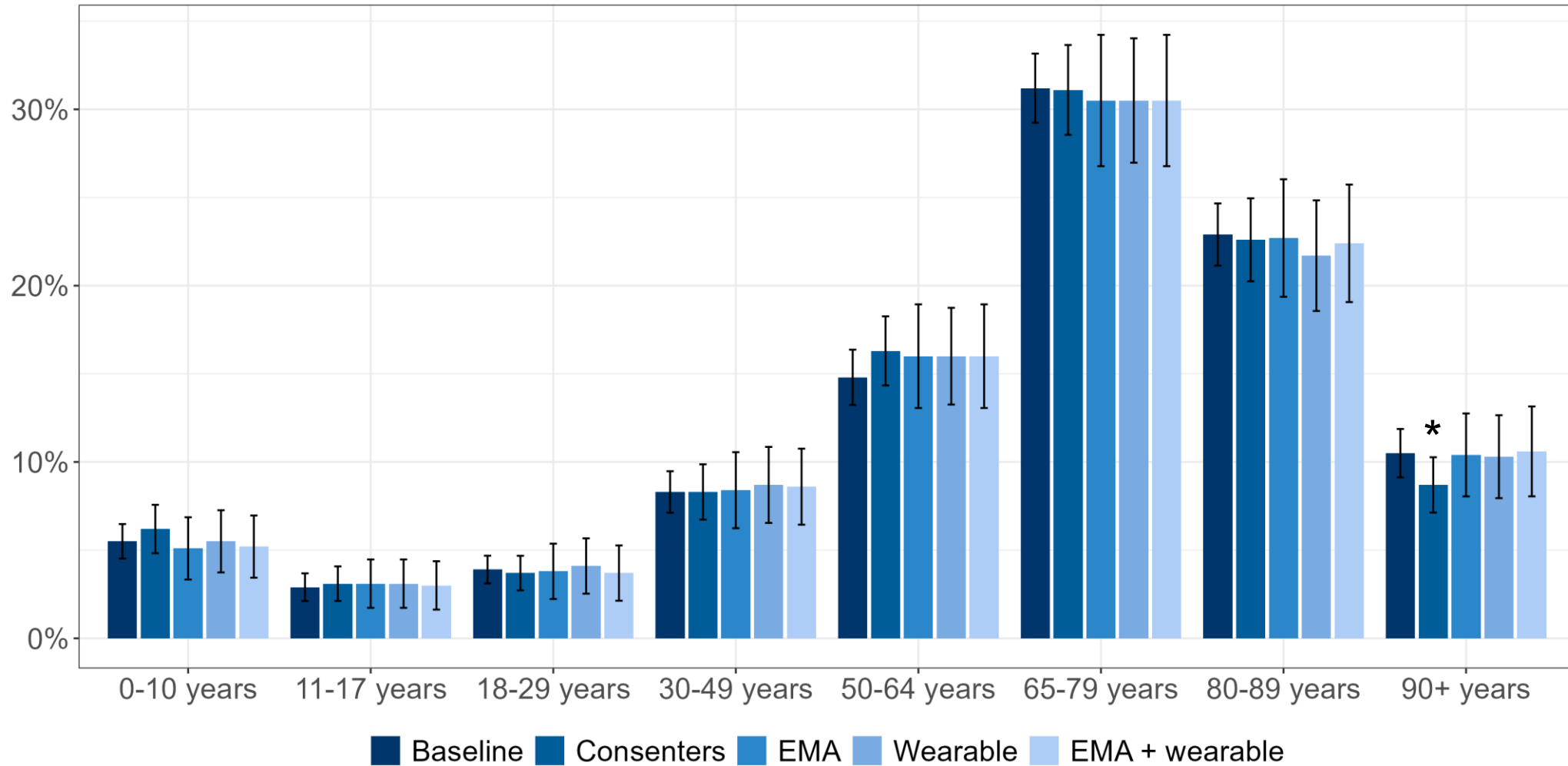
*Significant differences when comparing estimate to baseline sample ($p < 0.5$ using Benjamini-Hochberg correction for multiple testing).

Participation Bias: Caregiver Annual HH Income



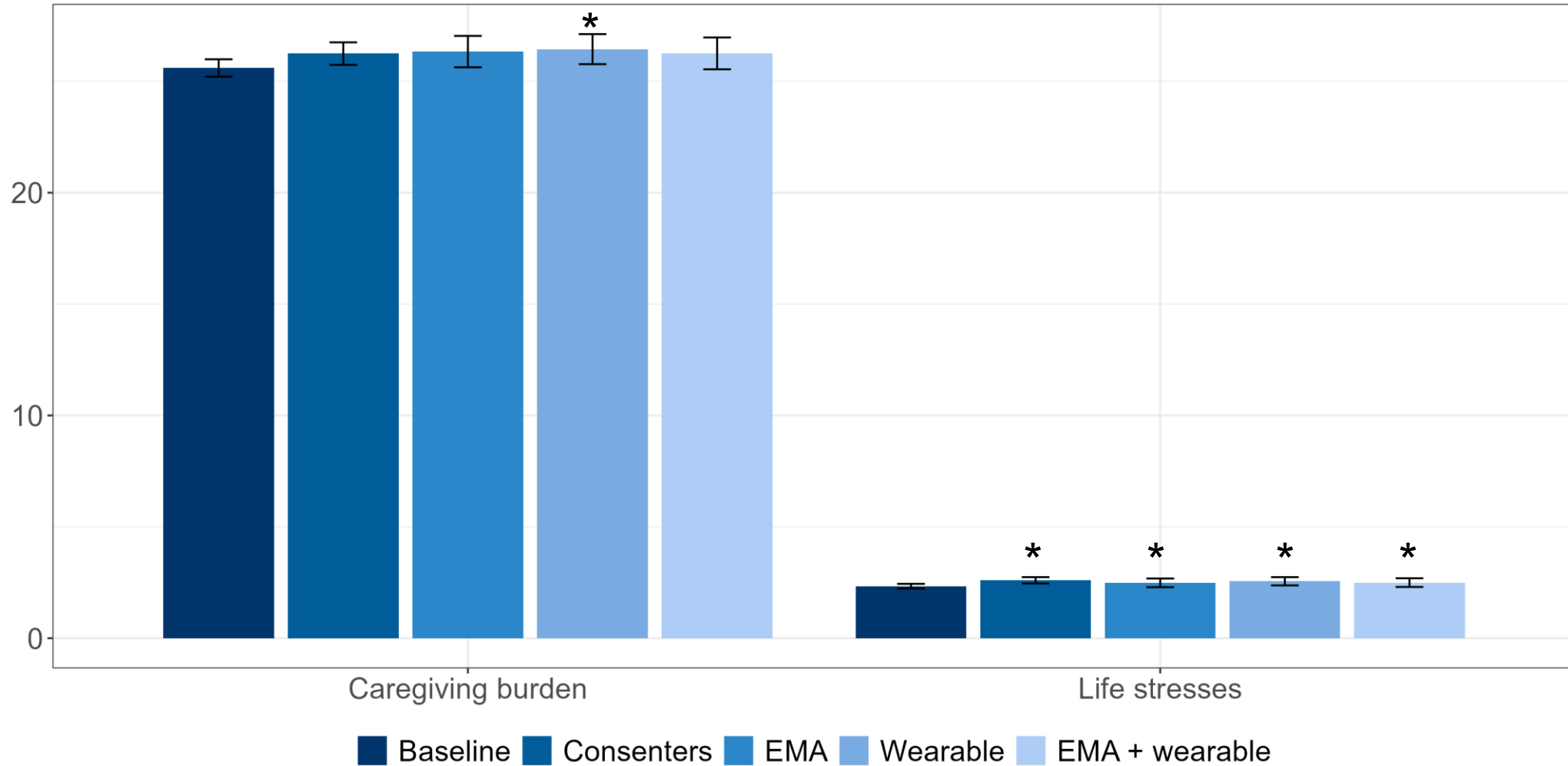
*Significant differences when comparing estimate to baseline sample ($p < 0.5$ using Benjamini-Hochberg correction for multiple testing).

Participation Bias: Care Recipient Age



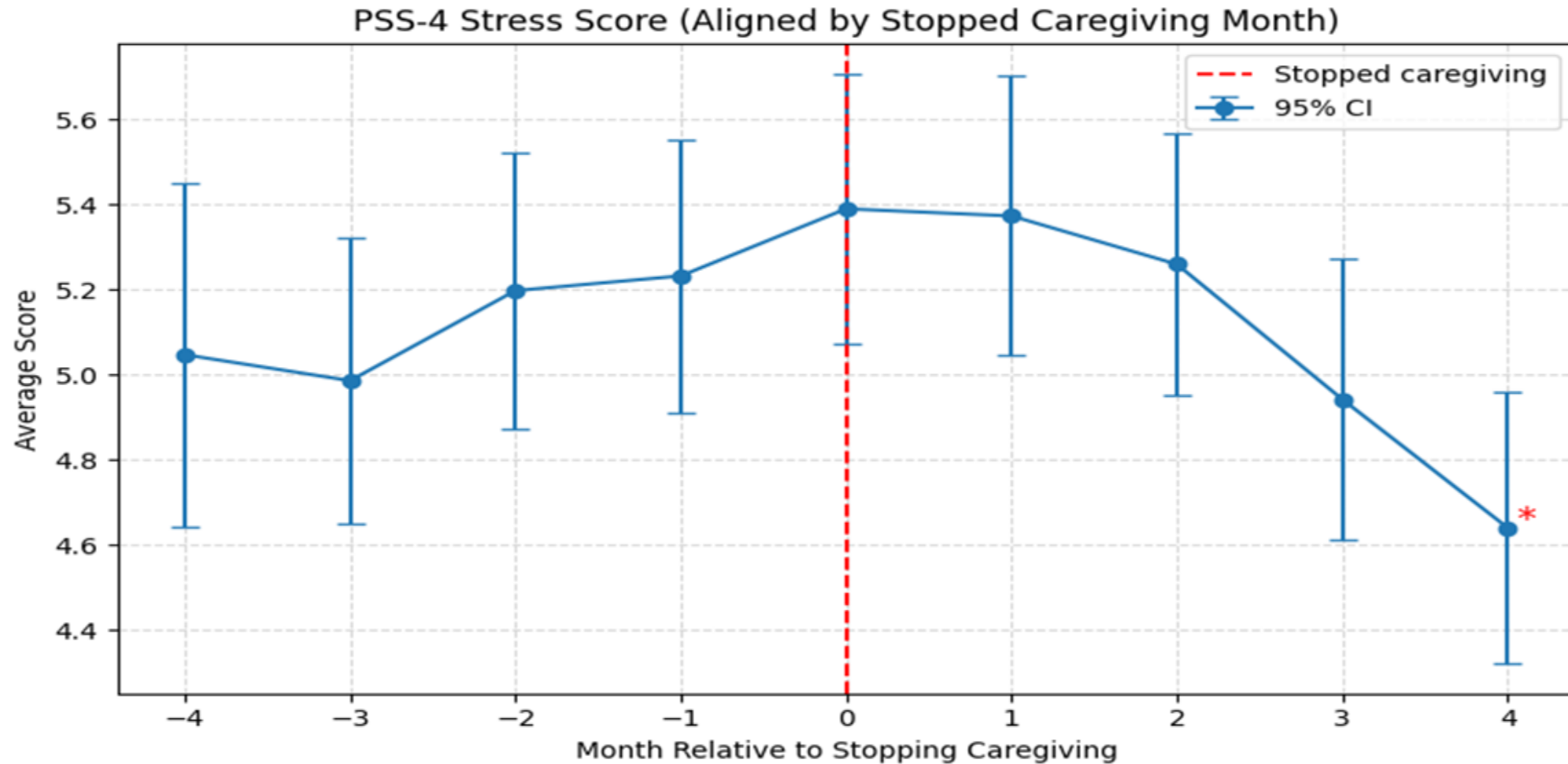
*Significant differences when comparing estimate to baseline sample ($p < 0.5$ using Benjamini-Hochberg correction for multiple testing).

Participation Bias: Caregiving Burden & Life Stresses

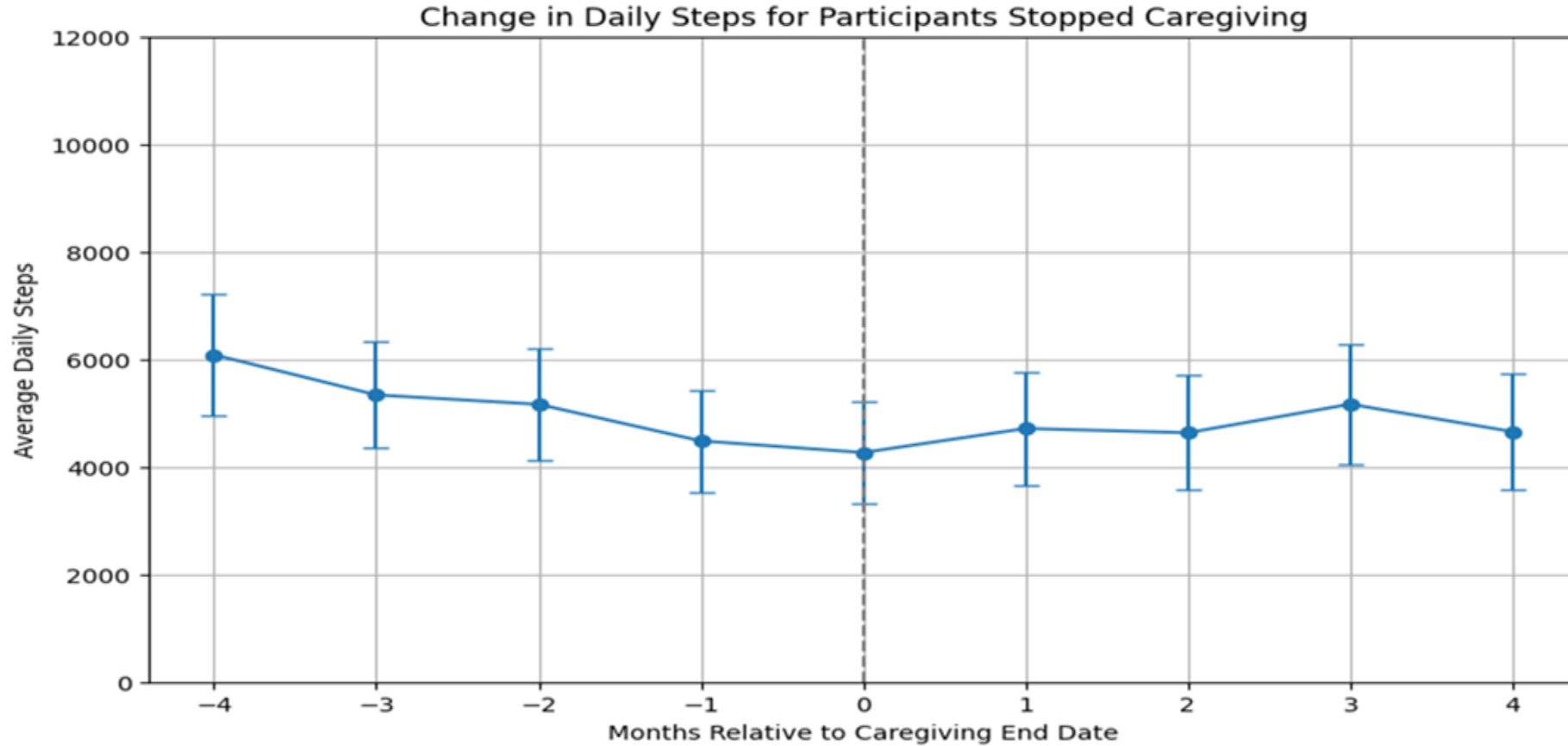


*Significant differences when comparing estimate to baseline sample ($p < 0.5$ using Benjamini-Hochberg correction for multiple testing).

Effect of Stopping Caregiving on Stress



Effect of Stopping Caregiving on Physical Activity



Summary & Outlook

- Except for age, very small non-participation bias in sociodemographic variables and stress measures
 - No bias in variables describing relationship between caregiver and care recipient, type of condition, no. of other health conditions, monthly hours providing care, years providing care, and care intensity
 - Different from other studies in general population showing substantial bias for consenters and study participants
 - Potential explanation: high topic involvement (?)
- Next steps:
- Assessing quality of wearable data
 - Comparing and combining self-reported stress in EMAs to HR/HRV data

Thank you!



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