



Racial identity moderates the association between depression and AD-relevant plasma biomarkers in a multi-ethnic cohort

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Introduction

- Black and Latine Americans experience disproportionately higher risk of Alzheimer's disease (AD) compared to non-Hispanic Whites (1).

- Racialized experiences, including discrimination and structural inequities, are associated with higher rates of depression (2).

Depression has been linked to AD through several mechanisms, including neurodegeneration and tau hyperphosphorylation (3).

- Present study examines whether racial identity modifies the relationship between depression and two AD-relevant biomarkers: phosphorylated Tau 181 (pTau181; marker of tau hyperphosphorylation) and neurofilament light chain (NfL; marker of neurodegeneration) in a diverse cohort.

Methods

- The sample included participants from the Health and Aging Brain Study-Health Disparities (HABS-HD; N=2074; 62% female).
- Depressive symptoms were assessed using the Geriatric Depression Scale (GDS), with scores ranging from 0-30 and higher scores indicating greater depressive symptom burden.
- pTau181 and NfL were selected from a larger plasma biomarker panel to assess hyperphosphorylation and neurodegeneration.
- ANOVA examined group differences in GDS scores across racial identities.
- Linear regression analyses assessed the association between GDS scores and plasma biomarker concentrations (log-transformed) and evaluated racial identity as a moderator using a GDS x Racial Identity interaction term.
 - Covariates: age, sex, APOE ε4 allele carriage, and Body Mass Index (BMI).

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Results

Figure 1. Minoritized racial groups experience higher levels of depression compared to White individuals.

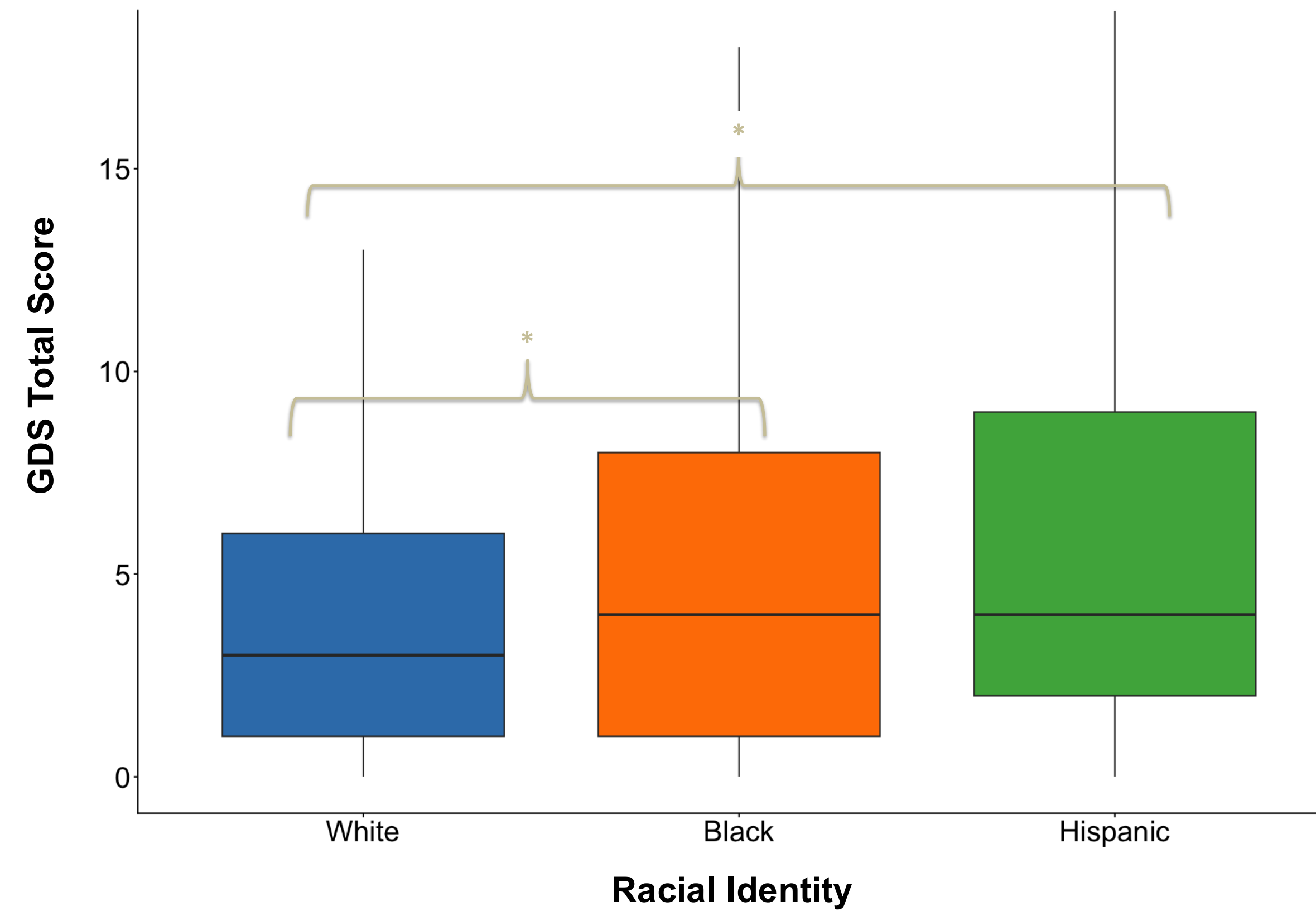


Figure 2. Racial identity modifies the association between GDS and biomarkers (A) pTau181 and (B) NfL.

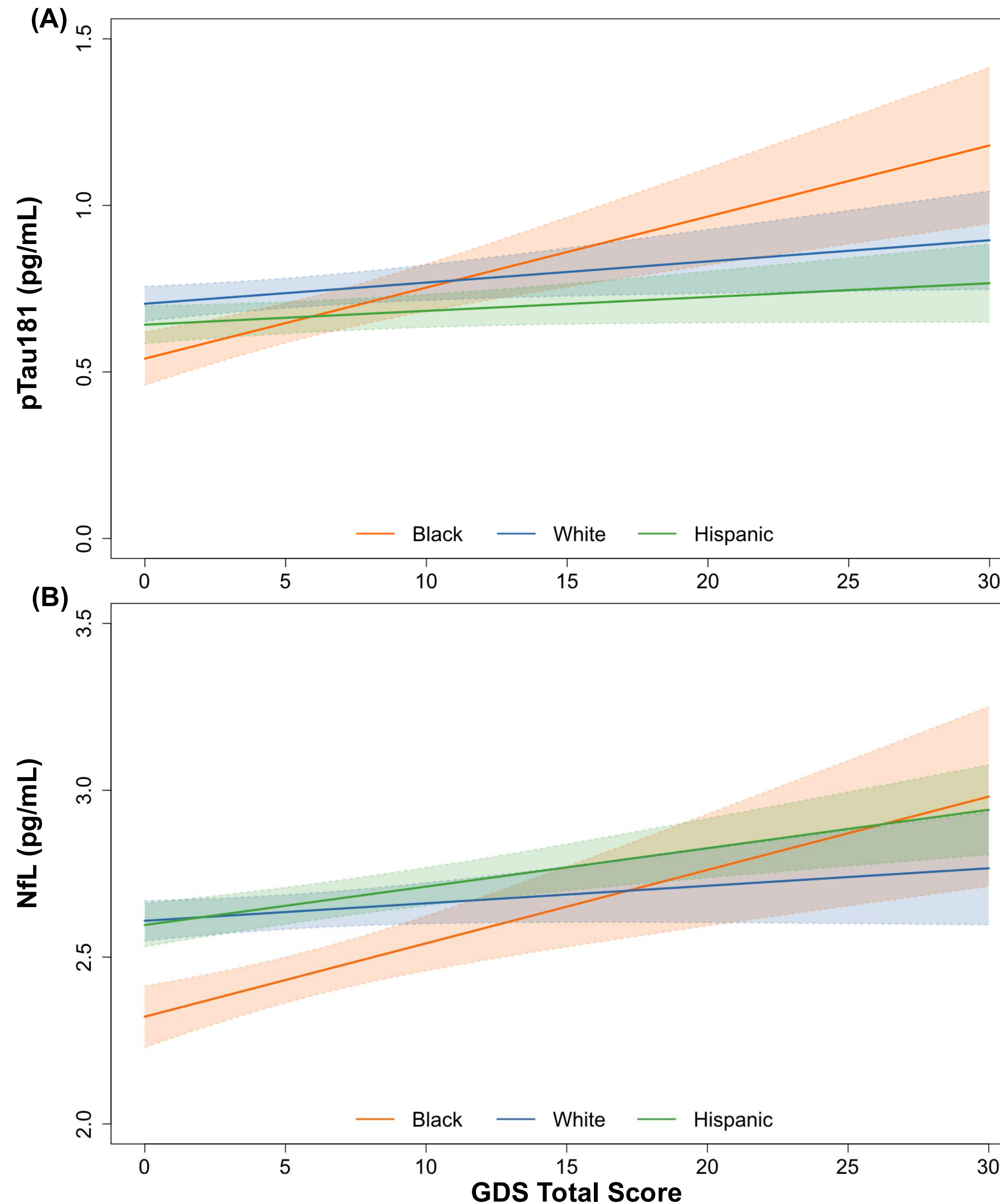


Table 1. Background Characteristics of Participants.

Characteristics		Overall (N=2074)	White (W) (N=918)	Black (B) (N=277)	Hispanic (H) (N=879)	P-value	Post-hoc
Age (years)	M (SD)	66.2 (8.7)	69.4 (8.7)	63.3 (7.7)	63.9 (8.0)	<0.001	W>H,B
Female	N (%)	1282 (61.8)	517 (56.3)	195 (70.4)	570 (64.8)	<0.001	B,H>W
APOE ε4	N (%)	536 (25.8)	268 (29.2)	104 (37.5)	164 (18.7)	<0.001	B>W>H
Body Mass Index (BMI)	M (SD)	30.3 (6.2)	29.0 (6.1)	33.0 (7.6)	30.7 (5.6)	<0.001	B>H>W
pTau181 (pg/mL)	M (SD)	2.1 (1.2)	2.4 (1.3)	1.9 (1.2)	1.9 (1.1)	<0.001	W>B,H
NfL (pg/mL)	M (SD)	17.0 (15.5)	18.7 (17.4)	12.3 (10.0)	16.6 (14.6)	<0.001	W>H>B
Geriatric Depression Scale (GDS; total score)	M (SD)	5.5 (5.7)	4.7 (5.0)	5.7 (5.4)	6.4 (6.2)	<0.001	H,B>W

Results Cont.

- Both Black and Hispanic participants had significantly higher GDS scores than White participants ($P < 0.001$; see Table 1).
- Higher GDS scores were associated with higher plasma concentrations of both pTau181 ($\beta = 0.02$, $P < 0.01$) and NfL ($\beta = 0.02$, $P < 0.01$) in Black relative to White participants.
- The associations between GDS scores and both plasma biomarkers (all $P_s > 0.12$) were not significant for Hispanic compared to White participants.

Discussion

- Minoritized racial groups experience higher levels of depression compared to White individuals.
- Black individuals with greater depressive symptoms had higher plasma concentrations of both tau hyperphosphorylation (pTau181) and neurodegeneration (NfL) compared to White individuals.
- Managing depressive symptoms may be a promising equity-focused intervention for mitigating racial disparities in AD-related risk.