

# Racial/ethnic differences in psychiatric and medical diagnoses among autistic adults

Jennifer L. Ames<sup>1</sup>, Yinge Qian<sup>1</sup>, Maria Massolo<sup>1</sup>, Lisa A. Croen<sup>1</sup>

<sup>1</sup> Kaiser Permanente Northern California Division of Research, Oakland California, USA

## OBJECTIVE

To describe racial/ethnic differences in the frequency of health diagnoses in autistic adults.

## BACKGROUND

- Racial and ethnic disparities in access to diagnostic and support services are pervasive for autistic children and youth, which has implications for health and well-being into adulthood.<sup>1,2</sup>
- However, few studies have examined racial/ethnic differences in diagnoses and healthcare use among autistic adults, who commonly experience a higher burden of many psychiatric and medical conditions than non-autistic adults.

## METHODS

**Study population:** Adult members (≥ 18 years) of Kaiser Permanente Northern California (KPNC) enrolled in the health plan for at least 9 months of each year from 2008-2012.

**ASD Ascertainment:** We ascertained adults who had an autism spectrum disorder (ASD) diagnosis documented in their KPNC medical records on at least 2 occasions by December 2012.

**Comparison cohort:** A comparison group of adults without any ASD diagnoses (N=15,070) was sampled at a 10:1 ratio and frequency-matched to autistic adults on total length of KPNC membership, gender, and age.

**Race/ethnicity data** was based on self-report in the medical records. Our sample was 46% White, 16% Hispanic, 16% Asian, 7% Black, and 14% other race/ethnicity.

**Psychiatric and medical diagnoses:** We examined physician-documented medical and psychiatric diagnoses routinely captured in KPNC's electronic medical records.

**Statistical analyses:** We first compared the health status of autistic adults with non-autistic controls within strata of race/ethnicity. We next examined racial/ethnic differences in medical and psychiatric conditions among autistic adults only. All analyses were conducted using logistic regression and included adjustment for age, gender, length of KPNC membership, and insurance payer.

## RESULTS

Table 1: Demographics of the study population by race/ethnicity, Kaiser Permanente Northern California

	White		Asian		Black		Hispanic		Other race/ethnicity	
	Autistic (N=988) n (%)	Non-autistic (N=6628) n (%)	Autistic (N=168) n (%)	Non-autistic (N=2525) n (%)	Autistic (N=115) n (%)	Non-autistic (N=1107) n (%)	Autistic (N=131) n (%)	Non-autistic (N=2601) n (%)	Autistic (N=105) n (%)	Non-autistic (N=2209) n (%)
Age, mean (SD) years	30.7 (13.3)	30.3 (13.2)	25.0 (8.6)	29.2 (11.6)	27.3 (9.2)	28.8 (12.5)	24.6 (8.7)	30.7 (13.6)	25.9 (9.3)	28.0 (9.9)
Age categories, N (%)										
18-24	473 (47.9)	3482 (52.5)	108 (64.3)	1278 (50.6)	61 (53.0)	627 (56.6)	89 (67.9)	1357 (52.2)	59 (56.2)	1156 (52.3)
25-29	116 (11.7)	718 (10.8)	23 (13.7)	337 (13.4)	16 (13.9)	115 (10.4)	13 (9.9)	408 (15.7)	25 (23.8)	352 (15.9)
30-39	141 (14.3)	797 (12.0)	24 (14.3)	433 (17.2)	23 (20.0)	121 (10.9)	16 (12.2)	389 (15.0)	8 (7.6)	380 (17.2)
40-49	130 (13.2)	796 (12.0)	8 (4.8)	266 (10.5)	13 (11.3)	137 (12.4)	10 (7.6)	277 (10.7)	8 (7.6)	214 (9.7)
50+	128 (13.0)	835 (12.6)	5 (3.0)	211 (8.4)	2 (1.7)	107 (9.7)	3 (2.3)	170 (6.5)	5 (4.8)	107 (4.9)
Sex, N (%)										
Male	718 (72.7)	4833 (72.9)	124 (73.8)	1723 (68.2)	80 (69.6)	711 (64.2)	94(71.2)	1851 (71.2)	86 (81.9)	1902 (86.1)
Female	270 (27.3)	1795 (27.1)	44 (26.2)	802 (31.8)	35 (30.4)	396 (35.8)	37 (28.2)	750 (28.8)	19 (18.1)	307 (13.9)
Total KP membership, mean (SD), months	59.8 (0.8)	59.7 (0.9)	59.8 (0.6)	59.7 (0.8)	59.9 (0.5)	59.6 (1.1)	59.8 (0.6)	59.7 (0.9)	59.7 (0.8)	59.6 (1.0)
Total KP membership, mean (SD), years	5.0 (0.1)	5.0 (0.1)	5.0 (0.1)	5.0 (0.1)	5.0 (0.0)	5.0 (0.1)	5.0 (0.1)	5.0 (0.1)	5.0 (0.1)	5.0 (0.1)
Type of insurance, N (%)										
KP	746 (75.5)	6363 (96.0)	120 (71.4)	2435 (96.4)	73 (63.5)	987 (89.2)	92 (70.2)	2512 (95.6)	76 (72.4)	2124 (96.2)
Medicaid	231 (23.4)	80 (1.2)	44 (26.2)	8 (0.3)	39 (33.9)	78 (7.1)	37(28.2)	31 (1.2)	24 (22.9)	7 (0.3)
Self-pay	11 (1.1)	185 (2.8)	4 (2.4)	82 (3.3)	3 (2.6)	42 (3.8)	2 (1.53)	58 (2.2)	5 (4.8)	78 (3.5)

## CONCLUSIONS AND IMPLICATIONS

Rates of many co-occurring medical and psychiatric conditions were higher in autistic adults compared with non-autistic adults, though the magnitude of the contrast differed by race/ethnicity.

The observed racial/ethnic differences among autistic adults mirror the racial/ethnic disparities that are widespread in the general population.

Future work will examine whether these differences reflect disparities in healthcare utilization, possibly identifying targets for intervention.

## LIMITATIONS

- Presence of psychiatric and medical conditions were determined by diagnoses recorded in the EHR and were not necessarily validated by a standardized clinical exam or by chart reviews
- While race/ethnicity is based on self-report, the categories captured were broad and likely mask important heterogeneity among mixed race and specific ethnic groups.

## Acknowledgements

This study was funded by a grant from the Working For Inclusive and Transformative Healthcare (WITH) Foundation (formerly the Special Hope Foundation)

## Contact

Jennifer Ames  
Email: [jennifer.l.ames@kp.org](mailto:jennifer.l.ames@kp.org)  
Autism Research Program  
Kaiser Permanente Division of Research  
2000 Broadway, Oakland, CA 94612  
[www.autismresearch.kaiser.org](http://www.autismresearch.kaiser.org)

## References

- Mandell, et al. (2009). Racial/ethnic disparities in the identification of children with autism spectrum disorders. American journal of public health, 99(3), 493-498.
- Liptak, et al. (2008). Disparities in diagnosis and access to health services for children with autism: data from the National Survey of Children's Health. Journal of Developmental & Behavioral Pediatrics, 29(3), 152-160.

## RESULTS (Cont.)

Figure 1: Frequencies of psychiatric conditions among autistic and non-autistic adults by race/ethnic groups

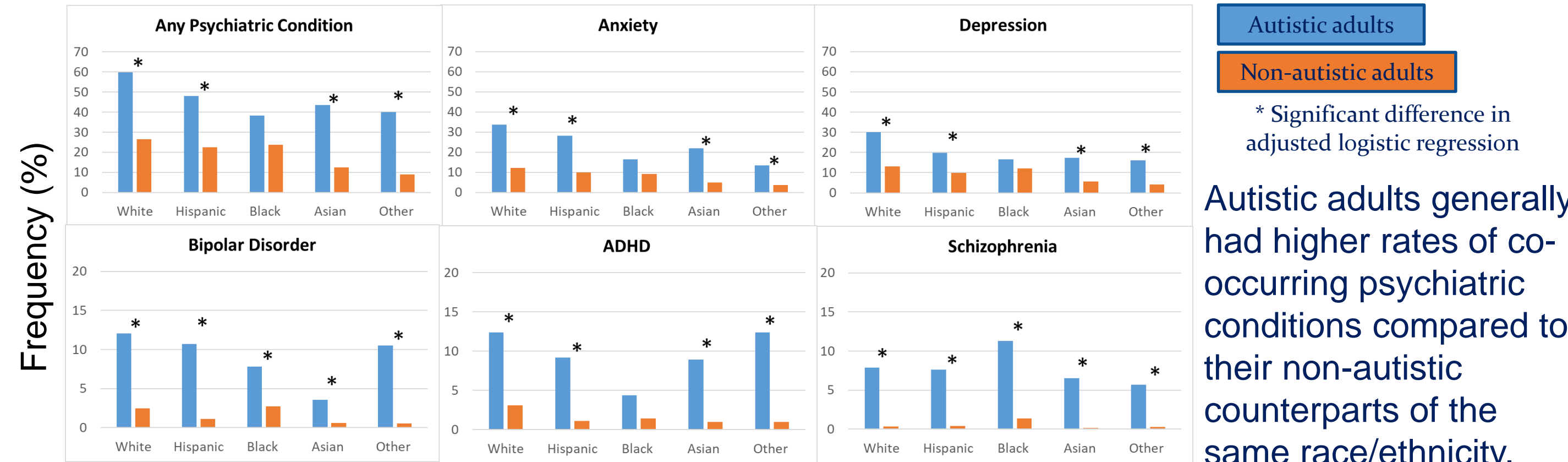
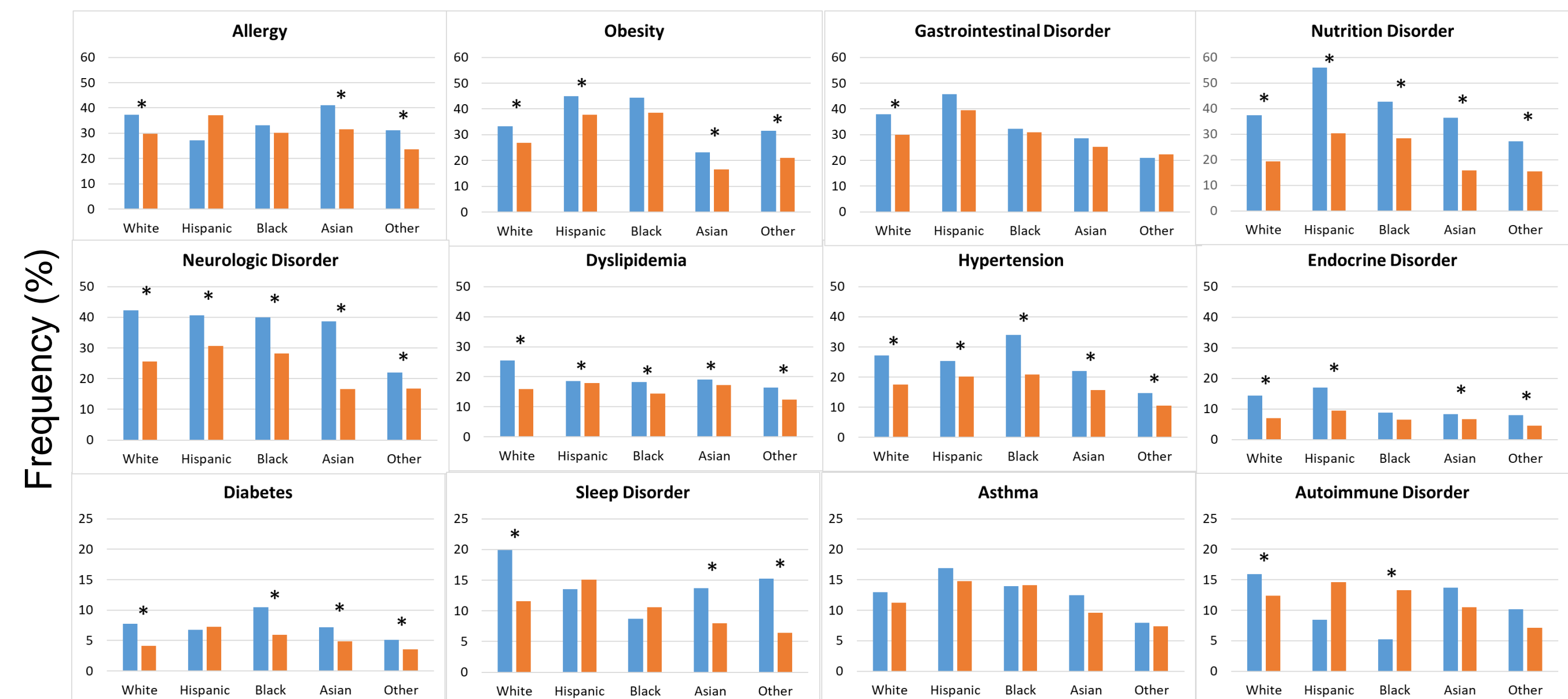


Figure 2: Frequencies of medical conditions among autistic and non-autistic adults by race/ethnic groups



Autistic adults had higher rates of some medical conditions compared to their non-autistic counterparts of the same race/ethnicity, with some exceptions such as asthma.

Table 2: Odds ratios of psychiatric and medical conditions comparing race/ethnic categories, among autistic adults

Psychiatric conditions	White OR (CI)	Hispanic OR (CI)	Black OR (CI)	Asian OR (CI)	Other OR (CI)
Anxiety disorder	1.00 (reference)	0.85 (0.57, 1.29)	0.42 (0.25, 0.71)	0.61 (0.41, 0.91)	0.33 (0.18, 0.59)
Attention Deficit Hyperactivity Disorder	1.00 (reference)	0.57 (0.30, 1.07)	0.3 (0.12, 0.74)	0.55 (0.31, 0.97)	0.83 (0.45, 1.55)
Bipolar Disorder	1.00 (reference)	0.81 (0.45, 1.47)	0.59 (0.29, 1.20)	0.25 (0.11, 0.58)	0.84 (0.44, 1.63)
Depression	1.00 (reference)	0.67 (0.42, 1.07)	0.52 (0.31, 0.87)	0.56 (0.37, 0.87)	0.52 (0.3, 0.9)
Obsessive-compulsive disorder	1.00 (reference)	0.61 (0.27, 1.35)	0.29 (0.09, 0.93)	1.04 (0.58, 1.86)	0.30 (0.09, 0.97)
Schizophrenic disorders	1.00 (reference)	1.17 (0.58, 2.36)	1.6 (0.85, 3.03)	0.99 (0.51, 1.94)	0.88 (0.37, 2.10)
Any Psychiatric condition	1.00 (reference)	0.69 (0.48, 1.01)	0.44 (0.30, 0.67)	0.57 (0.41, 0.80)	0.5 (0.33, 0.75)
Medical conditions					
Allergy	1.00 (reference)	0.66 (0.36, 1.2)	0.86 (0.56, 1.3)	1.29 (0.92, 1.82)	0.84 (0.59, 1.19)
Asthma	1.00 (reference)	1.51 (0.74, 3.1)	1.13 (0.64, 2)	1.07 (0.65, 1.78)	0.66 (0.37, 1.18)
Autoimmune Disease	1.00 (reference)	0.56 (0.22, 1.44)	0.31 (0.13, 0.72)	0.97 (0.6, 1.58)	0.7 (0.41, 1.18)
Cardiovascular diseases (all)	1.00 (reference)	0.97 (0.63, 1.50)	1.27 (0.83, 1.95)	1.08 (0.74, 1.58)	0.58 (0.35, 0.97)
Dyslipidemia	1.00 (reference)	1.04 (0.63, 1.74)	0.92 (0.54, 1.55)	1.2 (0.77, 1.88)	0.85 (0.48, 1.51)
Hypertension	1.00 (reference)	1.05 (0.66, 1.69)	1.86 (1.2, 2.88)	1.16 (0.77, 1.76)	0.55 (0.30, 1.02)
Diabetes	1.00 (reference)	1.51 (0.74, 3.08)	1.88 (0.96, 3.67)	1.42 (0.73, 2.75)	0.51 (0.16, 1.68)
Obesity	1.00 (reference)	1.83 (1.26, 2.66)	1.7 (1.15, 2.53)	0.67 (0.46, 0.99)	1.02 (0.66, 1.58)
Endocrine disorders (all)	1.00 (reference)	1.98 (0.94, 4.14)	0.64 (0.31, 1.33)	0.82 (0.45, 1.5)	0.7 (0.38, 1.3)
Neurologic diseases (all)	1.00 (reference)	0.79 (0.53, 1.18)	0.98 (0.65, 1.47)	1.02 (0.72, 1.45)	0.36 (0.21, 0.60)
Gastrointestinal disorders (all)	1.00 (reference)	1.13 (0.76, 1.66)	0.87 (0.57, 1.32)	0.8 (0.55, 1.16)	0.37 (0.22, 0.64)
Sleep disorders (all)	1.00 (reference)	0.73 (0.34, 1.57)	0.42 (0.21, 0.82)	0.74 (0.46, 1.18)	0.82 (0.52, 1.27)
Nutrition conditions (all)	1.00 (reference)	2.49 (1.45, 4.28)	1.34 (0.9, 2.01)	1.11 (0.78, 1.58)	0.72 (0.5, 1.04)

Among autistic adults, Black, Hispanic, and Asian adults were markedly less likely to be diagnosed with psychiatric conditions than their White counterparts. Black and Hispanic adults were more likely to be diagnosed with some major medical conditions, including obesity.