

Supplementary Table SI. Baseline characteristics of eligible participants from NHANES 2017–2020

Parameter	COPD	Non-COPD	<i>P</i> -value
Gender (%)			0.2363
Male	44.74 (3.31)	49.47 (1.11)	
Female	55.26 (3.31)	50.53 (1.11)	
Age (%)			< 0.0001
< 60	44.88 (4.99)	74.08 (1.57)	
≥ 60	55.12 (4.99)	25.92 (1.57)	
Race (%)			< 0.0001
Hispanic	7.08 (1.12)	15.43 (1.60)	
Non-Hispanic White	76.16 (2.81)	64.75 (2.34)	
Other races	16.76 (2.16)	19.82 (1.82)	
Education (%)			< 0.0001
Under high school	13.25 (1.72)	9.44 (0.53)	
High school or equivalent	40.20 (2.22)	24.98 (1.53)	
Above high school	46.54 (2.54)	65.57 (1.71)	
Marital status (%)			0.0035
With partner	59.70 (3.63)	65.38 (1.28)	
Widowed, divorced or separated	25.53 (2.58)	15.85 (0.73)	
Never married	14.77 (3.31)	18.76 (0.97)	
PIR (%)			< 0.0001
PIR < 1.3	27.38 (2.21)	16.78 (0.88)	
$1.3 \leq \text{PIR} < 3.5$	45.17 (4.34)	33.60 (1.38)	
PIR ≥ 3.5	27.45 (4.02)	49.62 (1.63)	
BMI (%)			0.0265
BMI < 25	20.35 (2.77)	26.27 (1.06)	
$25 \leq \text{BMI} < 30$	29.09 (2.62)	31.94 (0.96)	
BMI ≥ 30	50.56 (2.97)	41.79 (1.49)	
Hypertension (%)			< 0.0001

Yes	54.90 (3.73)	29.82 (1.33)	
No	45.10 (3.73)	70.18 (1.33)	
Diabetes (%)			< 0.0001
Yes	27.18 (3.04)	12.31 (0.56)	
No	72.82 (3.04)	87.69 (0.56)	
Cancer (%)			< 0.0001
Yes	22.81 (2.75)	10.14 (0.61)	
No	77.19 (2.75)	89.86 (0.61)	
Smoking (%)			< 0.0001
Never smoker	27.84 (2.53)	60.74 (1.29)	
Former smoker	36.98 (3.68)	25.21 (1.03)	
Current smoker	35.18 (4.03)	14.05 (0.93)	
Snoring (%)			< 0.0001
Never	19.70 (1.83)	26.39 (1.22)	
Rarely (1–2/week)	20.96 (2.07)	28.46 (0.91)	
Occasionally (3–4/week)	20.60 (2.53)	19.11 (0.86)	
Frequently (≥ 5 /week)	38.74 (2.98)	26.05 (0.90)	
Snorting/stopping breathing (%)			< 0.0001
Never	60.62 (4.72)	76.20 (0.84)	
Rarely (1–2/week)	16.34 (2.45)	13.21 (0.58)	
Occasionally (3–4/week)	10.13 (2.29)	6.16 (0.58)	
Frequently (≥ 5 /week)	12.91 (3.33)	4.43 (0.38)	
Sleepiness (%)			< 0.0001
Never	6.15 (1.04)	14.30 (0.93)	
Rarely (1/month)	19.40 (3.16)	23.87 (1.11)	
Sometimes (2–4/month)	31.08 (4.34)	36.29 (0.97)	
Often and almost always (≥ 5 /week)	43.37 (3.57)	25.54 (1.09)	
Uric acid [$\mu\text{mol/l}$]	324.15 $\pm$ 5.12	318.24 $\pm$ 2.11	0.2848

Participants with COPD: n = 519 before weighting, n = 14,666,389 after weighting. Participants without COPD: n = 5,420 before weighting, n = 165,148,144 after weighting. Continuous variables are presented as means with

standard errors (SEs). Categorical variables are presented as percentages with SEs.

Supplementary Table SII. Subgroup analyses of association between symptoms of OSA and COPD

Snoring	Never	Rarely (1–2 times/week)	(1–2 times/week)	Occasionally (3–4 times/week)	(3–4 times/week)	Frequently (5/week)	(≥ 5/week)	<i>P</i> -value interaction
		OR (95% CI)	<i>P</i> -value	OR (95% CI)	<i>P</i> -value	OR (95% CI)	<i>P</i> -value	
Race								
0.045								
Hispanic	Ref	0.64 (0.12, 3.41)	0.52	1.09 (0.29, 4.07)	0.88	0.55 (0.16, 1.89)	0.26	
Non-Hispanic	Ref	1.08 (0.56, 2.08)	0.77	1.18 (0.72, 1.93)	0.43	1.64 (0.91, 2.96)	0.43	
White								
Other races	Ref	2.01 (0.93, 4.32)	0.06	1.58 (0.65, 3.823)	0.23	2.97 (1.19, 7.45)	0.02	
Education								
< 0.001								
Under high school	Ref	0.39 (0.13, 1.17)	0.07	0.99 (0.39, 2.50)	0.98	0.82 (0.38, 1.78)	0.53	
High school or equivalent	Ref	0.89 (0.44, 1.79)	0.69	1.61 (0.80, 3.24)	0.13	1.51 (0.66, 3.44)	0.25	
Above high school	Ref	1.56 (0.76, 3.38)	0.16	1.09 (0.61, 1.94)	0.73	2.13 (1.19, 3.82)	0.02	
PIR								
0.004								
< 1.3	Ref	0.94	0.80	2.44	0.01	1.76 (0.98, 0.05		

		(0.52,		(1.31,		3.18)		
		1.69)		4.55)				
1.3 ≤ PIR < 3.5	Ref	1.09	0.76	0.96	0.88	2.47 (1.17,	0.02	
		(0.55,		(0.50,		5.23)		
		2.17)		1.84)				
≥ 3.5	Ref	1.20	0.63	0.81	0.70	0.75 (0.28,	0.49	
		(0.47,		(0.21,		2.04)		
		3.10)		3.07)				
Hypertension								< 0.001
Yes	Ref	0.75	0.34	0.79	0.40	1.01 (0.66,	0.97	
		(0.45,		(0.49,		1.53)		
		1.27)		1.30)				
No	Ref	2.03	0.03	2.25	0.01	3.11 (1.87,	< 0.01	
		(1.06,		(1.24,		5.19)		
		3.89)		4.07)				
Smoking								0.029
Never smoker	Ref	2.14	0.04	1.68	0.22	2.05 (0.85,	0.08	
		(1.00,		(0.63,		4.92)		
		4.60)		4.48)				
Former smoker	Ref	0.59	0.21	0.63	0.17	1.27 (0.66,	0.39	
		(0.23,		(0.29,		2.43)		
		1.54)		1.36)				
Current smoker	Ref	1.52	0.18	2.52	0.02	2.33 (0.78,	0.09	
		(0.75,		(1.20,		6.93)		
		3.09)		5.30)				
Snorting/stopping breathing	Never	Rarely	(1–2	Occasionally	(3–4	Frequently	(≥	<i>P</i>
		times/week)		times/week)		5/week)		interaction
PIR							<i>P</i>	< 0.001
< 1.3	Ref	2.22	0.05	2.01	0.19	1.61	0.16	

			(0.96, 5.17)		(0.59, 6.82)		(0.75, 3.44)	
1.3 ≤ PIR < 3.5	Ref	1.71	0.06	2.86	0.04	7.16	< 0.01	
			(0.95, 3.07)		(1.00, 8.20)		(2.63, 19.44)	
≥ 3.5	Ref	1.41	0.60	1.12	0.83	1.56	0.47	
			(0.42, 4.75)		(0.43, 2.87)		(0.51, 4.77)	
Smoking							< 0.001	
Never smoker	Ref	2.18	0.15	1.01	0.99	3.34	0.02	
			(0.65, 7.32)		(0.39, 2.62)		(1.30, 8.55)	
Former smoker	Ref	0.69	0.34	0.87	0.78	3.13	0.05	
			(0.34, 1.40)		(0.35, 2.18)		(1.26, 7.76)	
Current smoker	Ref	3.36	< 0.01	5.49	< 0.01	3.75	0.07	
			(1.59, 7.12)		(2.08, 14.47)		(0.83, 17.04)	
Sleepiness	Never	Rarely (1/month)		Sometimes (2–4/month)		Often or almost always (≥ 5/month)	<i>P</i> interaction	
		OR (95% CI)	<i>P</i> -value	OR (95% CI)		OR (95% CI)	<i>P</i> -value	
Education							0.001	
Under high school	Ref	0.64 (0.27, 1.48)	0.34	1.24 (0.55, 2.80)	0.62	1.73 (0.89, 3.38)	0.16	
High school or equivalent	Ref	4.32 (1.06, 17.62)	0.04	5.17 (1.73, 15.42)	< 0.01	6.42 (1.96, 21.03)	< 0.01	

Above high school	Ref	2.04 (0.72, 5.76)	0.13	1.36 (0.57, 3.26)	0.40	3.37 (1.25, 9.10)	0.02
Diabetes							0.042
Yes	Ref	4.03 (1.85, 8.76)	0.02	2.68 (1.45, 4.94)	0.03	5.26 (2.76, 10.02)	< 0.01
No	Ref	1.75 (0.83, 3.70)	0.09	1.88 (1.20, 2.93)	0.01	3.16 (1.54, 6.48)	< 0.01
Smoking							0.004
Never smoker	Ref	1.75 (0.66, 4.68)	0.19	1.14 (0.48, 2.70)	0.71	3.55 (1.45, 8.68)	0.01
Former smoker	Ref	2.41 (0.90, 6.45)	0.06	2.21 (1.06, 4.64)	0.03	2.45 (1.08, 5.56)	0.03
Current smoker	Ref	1.72 (0.72, 4.09)	0.16	2.94 (1.61, 5.36)	< 0.01	5.08 (2.66, 9.69)	< 0.01

Variables with a p interaction of < 0.05 are presented. COPD – chronic obstructive pulmonary disease. PIR – poverty-to-income ratio.