

Supplementary Table 1 Sample characteristics of idiopathic hypersomnia cohort versus non-idiopathic hypersomnia cohort prior to propensity score matching

	Idiopathic Hypersomnia Cohort (n=163)	Non-Idiopathic Hypersomnia Cohort (n=141,345)	<i>P</i>^a
Age, years, mean (SD)	38.45 (13.69)	47.77 (17.65)	<0.001
Female, n (%)	105 (64.4)	77551 (54.9)	0.014
Race, n (%)			0.049
White	130 (79.8)	101716 (72.0)	
Black/African American	19 (11.7)	18997 (13.4)	
Asian	3 (1.8)	9564 (6.8)	
Other race or origin/multi-race	11 (6.7)	11068 (7.8)	
Hispanic ethnicity, n (%)	23 (14.1)	18358 (13.0)	0.670
US Census Region, n (%)			0.278
Northeast	36 (22.1)	26623 (18.8)	
Midwest	33 (20.2)	27275 (19.3)	
South	66 (40.5)	54377 (38.5)	
West	28 (17.2)	33070 (23.4)	
Married/living with a partner, n (%)	78 (47.9)	82334 (58.3)	0.017
University degree/higher, n (%)	71 (43.6)	73965 (52.3)	0.002
Employment status, n (%)			<0.001
Employed (full-time, part-time, or self-employed)	108 (66.3)	86501 (61.2)	
Retired	11 (6.7)	29904 (21.2)	
Short-term/long-term disability	14 (8.6)	3710 (2.6)	
Unemployed	17 (10.4)	9544 (6.8)	
Annual household income, n (%)			0.004
<\$50,000	68 (41.7)	42922 (30.4)	
\$50,000 to <\$100,000	49 (30.1)	45205 (32.0)	
\$100,000+	40 (24.5)	46048 (32.6)	
Decline to answer	6 (3.7)	7170 (5.1)	
Insurance type, n (%)			<0.001
Commercially insured	80 (49.1)	74308 (52.6)	
Medicaid	37 (22.7)	10943 (7.7)	
Medicare	22 (13.5)	32784 (23.2)	
VA/CHAMPUS, TRICARE, not sure	10 (6.1)	6337 (4.5)	
Not insured	14 (8.6)	16973 (12.0)	
Smoking status, n (%)			<0.001
Current smoker	45 (27.6)	23685 (16.8)	
Former smoker	37 (22.7)	30368 (21.5)	
Never smoked	81 (49.7)	87292 (61.8)	
Days exercised vigorously for ≥20 mins within past month, mean (SD)	7.00 (8.45)	8.67 (9.39)	0.024

Notes:^aBolded *P* values indicate statistical significance (*P* values <0.05, two-tailed).**Abbreviations:** mins, minutes; SD, standard deviation.

Supplementary Table 2 Current prescription medication for sleep condition among idiopathic hypersomnia-treated cohort

	n (%)
Current prescription class among idiopathic hypersomnia-treated (not idiopathic hypersomnia-specific prescription)^a	n=72
Antidepressant	13 (18.1)
Barbiturate	0
Benzodiazepine sedative-hypnotic	15 (20.8)
GABA-A receptor antagonist	5 (6.9)
GABA-B receptor agonist (oxybates) ^{b,c}	3 (4.2)
H3 (histamine-3) receptor antagonist/inverse agonist	0
Melatonin/Melatonin receptor agonist	5 (6.9)
Nonbenzodiazepine sedative-hypnotic	16 (22.2)
Orexin receptor antagonist	9 (12.5)
Stimulant or wakefulness-promoting (alerting agent)	50 (69.4)
Stimulant	28 (38.9)
Wakefulness-promoting	25 (34.7)
Current prescription drug among idiopathic hypersomnia-treated (not idiopathic hypersomnia-specific prescription)^a	n=72
Alprazolam	2 (2.8)
Amitriptyline	3 (4.2)
Amphetamine ^d	18 (25.0)
Armodafinil ^e	11 (15.3)
Clarithromycin	2 (2.8)
Daridorexant ^b	1 (1.4)
Dextroamphetamine ^d	4 (5.6)
Diazepam ^b	5 (6.9)
Doxepin	1 (1.4)
Eszopiclone	2 (2.8)
Flumazenil	3 (4.2)
Flurazepam	3 (4.2)
High sodium oxybate ^b	2 (2.8)
Lemborexant	5 (6.9)
Lisdexamfetamine ^d	6 (8.3)
Lorazepam	5 (6.9)
Low sodium oxybate ^b	1 (1.4)
Melatonin ^b	3 (4.2)
Methamphetamine ^d	3 (4.2)
Methylphenidate ^d	5 (6.9)
Mirtazapine	1 (1.4)
Modafinil ^e	14 (19.4)
Phenobarbital	0
Pitolisant	0
Ramelteon	2 (2.8)
Solriamfetol ^e	1 (1.4)
Suvorexant	4 (5.6)

Tasimelteon	0
Temazepam	0
Trazodone	9 (12.5)
Triazolam	7 (9.7)
Zaleplon	0
Zolpidem	15 (20.8)

Notes:

^aAs current prescription drug(s) was not asked separately by sleep condition, a respondent could have been taking a prescription drug for another sleep condition other than idiopathic hypersomnia.

^bDrugs were available in 2023 data only.

^cAll respondents who reported taking an oxybate for their sleep condition also reported taking an alerting agent (stimulant and/or wakefulness-promoting drug).

^dDenotes a stimulant.

^eDenotes a wake-promoting agent.

Supplementary Table 3 Mean (95% CI) SF-36v2 and RAND-36 domain scale scores among adults with idiopathic hypersomnia versus matched non-idiopathic hypersomnia cohort

Measure	Idiopathic Hypersomnia Cohort	Matched Non-Idiopathic Hypersomnia Cohort	Effect Size and 95% CI	<i>P</i> ^a
	Mean (95% CI)	Mean (95% CI)	SMD (95% CI)	
SF-36v2 Physical Health Domain^{b,c}	n=57	n=111		
Physical functioning	44.88 (42.42–47.35)	48.44 (46.14–50.74)	0.310 (–0.011–0.631)	0.016
Role-physical	42.46 (39.92–45.01)	48.56 (46.37–50.75)	0.546 (0.222–0.871)	<0.001
Bodily pain	43.79 (41.52–46.07)	48.28 (46.28–50.29)	0.443 (0.120–0.766)	<0.001
General health	41.25 (38.59–43.91)	47.80 (45.75–49.85)	0.608 (0.282–0.934)	<0.001
SF-36v2 Mental Health Domain^{b,c}	n=57	n=111		
Social functioning	39.22 (36.52–41.92)	45.60 (43.11–48.09)	0.512 (0.188–0.836)	<0.001
Role-emotional	38.03 (34.39–41.66)	44.56 (41.96–47.17)	0.466 (0.143–0.790)	0.002
Vitality	38.79 (36.22–41.35)	46.50 (44.31–48.68)	0.692 (0.364–1.020)	<0.001
Mental health	40.91 (37.78–44.04)	44.51 (41.85–47.16)	0.265 (–0.055–0.586)	0.034
RAND-36 Physical Health Domain^{c,d}	n=106	n=215		
Physical functioning	39.96 (37.59–42.34)	48.10 (46.35–49.84)	0.632 (0.394–0.870)	<0.001
Role-physical	38.72 (36.60–40.83)	47.04 (45.41–48.67)	0.703 (0.464–0.942)	<0.001
Bodily pain	39.54 (37.47–41.61)	45.25 (43.78–46.71)	0.523 (0.287–0.759)	<0.001
General health	39.57 (37.57–41.56)	44.40 (42.97–45.82)	0.456 (0.221–0.692)	<0.001
RAND-36 Mental Health Domain^{c,d}	n=106	n=215		
Social functioning	32.29 (29.69–34.90)	40.19 (38.18–42.19)	0.542 (0.306–0.778)	<0.001
Role-emotional	32.54 (30.15–34.92)	42.05 (40.08–44.01)	0.677 (0.439–0.916)	<0.001
Vitality	39.06 (37.20–40.91)	43.48 (41.98–44.99)	0.411 (0.176–0.646)	<0.001
Mental health	35.65 (33.81–37.49)	40.62 (38.97–42.28)	0.430 (0.195–0.665)	<0.001

Notes:

^a The SF-36v2 and RAND-36 domain-level subscale scores were secondary outcomes and were evaluated using a Bonferroni-adjusted significance threshold of $\alpha < 0.0031$. Bolded *P* values indicate statistical significance.

^b SF-36v2 completed by 2021 US NHWS respondents.

^c Scores range from 0 to 100; a higher score indicates better HRQoL.

^d RAND-36 completed by 2023 US NHWS respondents.

Abbreviations: CI, confidence interval; HRQoL, health-related quality of life; NHWS, National Health and Wellness Survey; RAND-36, 36-item RAND Short Form Survey; SF-36v2, 36-item Short Form Health Survey version 2; SF-6D, Short Form Six-Dimension; SMD, standardized mean difference.

Supplementary Table 4 Frequency of ≥ 1 HCRU visit in past 6 months among adults with idiopathic hypersomnia versus matched non-idiopathic hypersomnia cohort

HCRU Type	Idiopathic Hypersomnia Cohort (n=163)		Matched Non-Idiopathic Hypersomnia Cohort (n=326)		Effect Size and 95% CI	<i>P</i> ^a
	n (%)	95% CI	n (%)	95% CI	PR (95% CI)	
≥ 1 HCP visit in past 6 months	159 (97.55)	95.20–99.95	244 (74.85)	69.76–80.30	1.30 (1.21–1.40)	<0.001
Neurologist	34 (20.86)	15.47–28.13	15 (4.60)	2.84–7.45	4.53 (2.60–7.90)	<0.001
Pulmonologist	16 (9.82)	6.16–15.63	2 (0.61)	0.15–2.43	16.00 (3.68–69.59)	<0.001
Psychiatrist	53 (32.52)	26.06–40.56	23 (7.06)	4.74–10.50	4.61 (3.04–6.98)	<0.001
Psychologist/therapist	52 (31.90)	25.49–39.92	14 (4.29)	2.42–7.62	7.43 (3.93–14.04)	<0.001
≥ 1 ED visit in past 6 months	57 (34.97)	28.36–43.11	57 (17.48)	13.68–22.35	2.00 (1.47–2.72)	<0.001
≥ 1 Hospitalization in past 6 months	39 (23.93)	18.20–31.46	35 (10.74)	7.84–14.70	2.23 (1.52–3.27)	<0.001

Notes:

^aThe binary HCRU indicators (≥ 1 visit in the past 6 months by visit type) were secondary outcomes and were evaluated using a Bonferroni-adjusted significance threshold of $\alpha < 0.0042$. Bolded *P* values indicate statistical significance.

Abbreviations: CI, confidence interval; ED, emergency department; HCP, healthcare provider; HCRU, healthcare resource use; PR, prevalence ratio.

Supplementary Table 5 Medians with first and third quartiles for economic outcomes among adults with idiopathic hypersomnia and matched non-idiopathic hypersomnia cohort

Measure	Idiopathic Hypersomnia Cohort (n=163)	Matched Non-Idiopathic Hypersomnia Cohort (n=326)
	Median (Q1–Q3)	Median (Q1–Q3)
Healthcare resource use		
Number of HCP visits, ^a past 6 mos	9 (4–17)	2 (0–4)
Neurologist visits	0	0
Pulmonologist visits	0	0
Psychiatrist visits	0 (0–2)	0
Psychologist/therapist visits	0 (0–2)	0
Number of ED visits, past 6 mos	0 (0–1)	0
Number of hospitalizations, past 6 mos	0	0
Annualized Direct Medical Costs, USD		
HCP Visits Costs	6511.64 (2840–13090)	1607.04 (0–3120)
ED Visits Costs	0 (0–2926.07)	0
Hospitalizations Costs	0	0
Total Direct Medical Costs	10556 (4344–35432.1)	1627.91 (770–4821.12)
Work Productivity and Activity Impairment^b		
Absenteeism (%), valid N	103	186
Median (Q1–Q3)	6 (0–42)	0 (0–13)
Presenteeism (%), valid N	102	178
Median (Q1–Q3)	40 (20–60)	20 (0–50)
Overall Work Productivity Impairment (%), valid N	102	178
Median (Q1–Q3)	55 (20–75)	20 (0–50)
Activity Impairment (%)	50 (20–70)	20 (0–50)
Annualized Indirect Costs, USD		
Absenteeism-related costs ^c , Valid N	107	204
Median (Q1–Q3)	1614.87 (0–5071.57)	0 (0–2024.45)
Presenteeism-related costs ^c , Valid N	102	178
Median (Q1–Q3)	6663.28 (1614.87–17440.56)	3779.67 (0–12678.92)
Total Indirect Costs, Valid N	107	204
Median (Q1–Q3)	10131.5 (4208.83–22444)	4963.83 (0–16246.88)

^aIncludes visits to any of the following: General Practitioner/Family Practitioner; Internist; Allergist; Cardiologist; Dentist; Dermatologist; Diabetologist; Endocrinologist; Gastroenterologist; Geriatrician; Gynecologist; Hepatologist; Infectious Disease Specialist/Infectologist (diseases such as HIV or Hepatitis); Neurologist; Nephrologist; Nurse Practitioner/Physician Assistant; Obstetrician; Oncologist; Ophthalmologist; Orthopedist; Otolaryngologist (Ears, Nose, and Throat specialist); Plastic Surgeon; Podiatrist; Psychiatrist; Psychologist / Therapist; Pulmonologist (Lung specialist); Respiratory Therapist; Rheumatologist; Urologist; Other medical specialist.

^bScores range from 0 to 100; a higher score indicates more impairment [Reilly Associates]. Absenteeism was not calculated for those who worked 0 hours and missed 0 hours in the last 7 days, and presenteeism is only asked among those who worked >0 hours in the last 7 days.

^cAnnualized absenteeism-related indirect costs were calculated for those who had a valid response to number of hours missed, annualized presenteeism-related indirect costs were calculated for those who had a valid response to both number of hours worked and work productivity affected

Abbreviations: ED, emergency department; HCP, healthcare provider; HIV, human immunodeficiency virus; mos, months; Q1, first quartile; Q3, third quartile; USD, United States dollar.

Supplementary Table 6a HCRU outcomes after removal of extreme outliers among adults with idiopathic hypersomnia versus matched non-idiopathic hypersomnia cohort

Measure		Idiopathic Hypersomnia Cohort (n=163)	Matched Non-Idiopathic Hypersomnia Cohort (n=326)	Effect Size and 95% CI	<i>P</i> ^a
Number of HCP visits, ^b past 6 mos	Valid N Mean (95% CI) Median (Q1–Q3)	158 10.82 (9.34–12.30) 8 (3–15)	326 3.14 (2.64–3.63) 2 (0–4)	SMD (95% CI) 1.17 (0.966–1.373)	<0.001
Neurologist visits	Valid N Mean (95% CI) Median (Q1–Q3)	162 0.40 (0.26–0.62) 0	326 0.09 (0.05–0.17) 0	PR (95% CI) 4.36 (2.06–9.21)	<0.001
Psychiatrist visits	Valid N Mean (95% CI) Median (Q1–Q3)	162 1.17 (0.87–1.58) 0 (0–2)	326 0.17 (0.10–0.26) 0	PR (95% CI) 7.08 (4.36–11.51)	<0.001
Number of ED visits, past 6 mos	Valid N Mean (95% CI) Median (Q1–Q3)	160 0.72 (0.54–0.96) 0 (0–1)	323 0.33 (0.24–0.44) 0	PR (95% CI) 2.21 (1.48–3.31)	<0.001
Number of hospitalizations, past 6 mos	Valid N Mean (95% CI) Median (Q1–Q3)	162 0.64 (0.45–0.92) 0	324 0.20 (0.14–0.30) 0	PR (95% CI) 3.15 (1.89–5.26)	<0.001

Notes:

^a*P* values <0.05, two-tailed, were considered statistically significant. Bolded *P* values indicate statistical significance.

^bIncludes visits to any of the following: General Practitioner/Family Practitioner; Internist; Allergist; Cardiologist; Dentist; Dermatologist; Diabetologist; Endocrinologist; Gastroenterologist; Geriatrician; Gynecologist; Hepatologist; Infectious Disease Specialist/Infectologist (diseases such as HIV or Hepatitis); Neurologist; Nephrologist; Nurse Practitioner/Physician Assistant; Obstetrician; Oncologist; Ophthalmologist; Orthopedist; Otolaryngologist (Ears, Nose, and Throat specialist); Plastic Surgeon; Podiatrist; Psychiatrist; Psychologist / Therapist; Pulmonologist (Lung specialist); Respiratory Therapist; Rheumatologist; Urologist; Other medical specialist.

Abbreviations: CI, confidence interval; ED, emergency department; HCP, healthcare provider; HCRU, healthcare resource use; HIV, human immunodeficiency virus; mos, months; Q1, first quartile; Q3, third quartile; PR, prevalence ratio; SMD, standardized mean difference.

Supplementary Table 6b Direct medical cost outcomes after removal of extreme outliers among adults with idiopathic hypersomnia versus matched non-idiopathic hypersomnia cohort

Measure		Idiopathic Hypersomnia Cohort (n=163)	Matched Non-Idiopathic Hypersomnia Cohort (n=326)	Effect Size (SMD) and 95% CI	<i>P</i> ^a
HCP visits costs	Valid N	158	326		
	Mean (95% CI)	8550.04 (7376.00–9724.08)	2470.94 (2084.00–2857.88)	1.17 (0.965–1.373)	<0.001
	Median (Q1–Q3)	6428.16 (2441.872–12052.80)	1607.04 (0–3120.00)		
ED visits costs	Valid N	160	323		
	Mean (95% CI)	2068.85 (1466.62–2671.08)	924.41 (651.17–1197.65)	0.377 (0.186–0.568)	<0.001
	Median (Q1–Q3)	0 (0–2926.07)	0		
Hospitalizations costs	Valid N	162	324		
	Mean (95% CI)	20569.15 (13100.63–28037.68)	6533.27 (3979.07–9087.47)	0.414 (0.224–0.604)	<0.001
	Median (Q1–Q3)	0	0		
Total direct medical costs	Valid N	154	323		
	Mean (95% CI)	27954.26 (20347.95–35560.57)	9317.71 (6682.19–11953.22)	0.551 (0.356–0.746)	<0.001
	Median (Q1–Q3)	9642.24 (4017.60–24105.60)	1627.91 (770–4821.12)		

Notes:

^aTotal direct medical costs was a primary outcome; *P* value <0.05, two-tailed, was considered statistically significant. HCP visits costs, ED visits costs, and hospitalization costs were secondary outcomes and were evaluated using a Bonferroni-adjusted significance threshold of α <0.0042. Bolded *P* values indicate statistical significance.

Abbreviations: CI, confidence interval; ED, emergency department; HCP, healthcare provider; SMD, standardized mean differences; Q1, first quartile; Q3, third quartile.

Supplementary Figure 1 Love plot depicting balance diagnostics between adults with idiopathic hypersomnia and adults without idiopathic hypersomnia for all covariates before and after matching

