



SCAN ME

Reduced Healthcare Resource Utilization in Patients With Chronic Insomnia 24 Months After Treatment With Digital CBT-I: A Matched-Control Study

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INTRODUCTION

Chronic insomnia is a significant public health problem that poses a substantial economic burden on patients and healthcare organizations, with direct and indirect costs in the United States that exceed US\$100 billion annually.¹

Guideline-recommended first-line treatment is known as cognitive behavioral therapy for insomnia (CBT-I).

Prescription digital therapeutics (PDTs) are a new class of software-based disease treatments that deliver evidence-based therapeutic interventions, such as CBT-I, on smartphones or tablets.

OBJECTIVE

To examine the impact of a PDT on healthcare resource use (HCRU) by comparing patients treated with digital cognitive-behavioral therapy for insomnia (dCBTi) to patients not treated with dCBTi but with insomnia medications.

METHODS

DESIGN & INCLUSION CRITERIA

- Retrospective analysis of claims data that compared HCRU in U.S. patients with self-identified sleep problems who activated the PDT between June 1, 2016, and October 31, 2018, vs. patients who did not register for dCBTi but who initiated a second prescription for an insomnia medication in the same time period (controls).
- Observation period was 16 to 24 months. Index date for PDT group was date of PDT initiation; index date for controls was date of second prescription for sleep medication.

INTERVENTION

- The PDT provides dCBT-I to patients in outpatient settings. The intervention did not require patients be supervised by clinicians.
- Content is delivered via 6 interactive treatment modules designed to parallel the traditional, face-to-face delivery and structure of CBT-I sessions.

ENDPOINTS

- HCRU categories assessed were: hospitalizations, treat-and-release emergency department (ED) visits, ambulatory surgical center (ASC) visits, hospital outpatient department (HOPD) visits, office visits, use of sleep medications, and associated healthcare costs.
- Costs were estimated by multiplying HCRU by published average costs for each medical resource.²⁻⁶

LIMITATIONS

- This study is subject to the limitations of administrative claims data: coding errors that include under-coding, over-coding, or not coding at the highest level of specificity, and unbundling.

RESULTS

Demographics and Clinical Characteristics

Demographic/Characteristic	Control Cohort (N = 248)	dCBTi Cohort (N = 248)
Age (years), median	55.0	56.5
Sex, n (%)		
Female	139 (56.0)	142 (57.3)
Commercial	147 (59.3)	132 (53.2)
Medicaid	4 (1.6)	3 (1.2)
Payer, n (%)		
Medicare	20 (8.1)	20 (8.1)
Other	1 (0.4)	5 (2.0)
Self-insured	61 (24.6)	69 (27.8)
Unknown	15 (6.0)	19 (7.7)
Census region, n (%)		
Northeast	51 (20.6)	62 (25.0)
South	93 (37.5)	83 (33.5)
Midwest	48 (19.4)	48 (19.4)
West	56 (22.6)	55 (22.2)
Charlson comorbidity score, Mean (SD)	0.7 (1.30)	0.7 (1.46)
Sleep apnea, n (%)	34 (13.7)	81 (32.7)
CPAP use, n (%)	2 (0.8)	6 (2.4)
Pre-index prescription insomnia-related medication, n (%)	248 (100.0)	130 (52.4)

Number-Needed-to-Treat (NNT) Analyses

6 for hospitalization or ED visit
7 for HOPD visit
23 for ASC visit

Difference-in-Difference Analyses, dCBT-I vs. Control

192% reduction in IP stays
85% reduction in HOPD visits
80% reduction in ED visits
29% reduction in ASC visits

ASC=ambulatory surgical center; ED=emergency department; HOPD=hospital outpatient department; IP = inpatient stays.

CONCLUSIONS

- Patients with chronic insomnia who used a dCBTi treatment had significant and durable real-world reductions in hospital inpatient stays, ED visits, hospital outpatient visits, and office visits compared to matched controls treated with medications.
- This difference in HCRU was associated with per-patient cost savings over 24 months of \$8,202 compared to controls.

Per-Patient Cost Reductions 24 Months After PDT Initiation

Resource	Incidence in dCBT-I Patients (PDT), N = 248	Incidence in Controls N= 248	Difference	Unit Cost	Total Cost Difference	Per-Patient Cost Difference
Inpatient stays	88.040	193.936	-105.896	\$11,700.00	(\$1,238,983)	-\$4,996
ED visits - not admitted	67.456	164.672	-97.216	\$1,389.00	(\$135,033)	-\$544
ASC visits	87.544	113.584	-26.04	\$3,160.00	(\$82,286)	-\$332
HOPD visits	681.008	1070.616	-389.608	\$1,275.00	(\$496,750)	-\$2,003
Office Visits	5473.112	5879.832	-406.72	\$199.00	(\$80,937)	-\$326
Total					(\$2,033,990)	-\$8,202

ASC=ambulatory surgical center; ED=emergency department; HOPD=hospital outpatient department.

In the 24 months following PDT initiation, cases experienced

*P=0.001; **P<0.001



59%**
Reduction in emergency department services (IRR = 0.41)



55%*
Reduction in inpatient stays (IRR = 0.45)



36%**
Reduction in hospital outpatient visits (IRR = 0.64)



23%
Reduction in ambulatory surgical center services (IRR = 0.77)



7%
Reduction in office visits (IRR = 0.93)

KEY TAKEAWAYS

- This study demonstrates that digital delivery of CBT-I was associated with significant and durable real-world HCRU reductions and cost savings compared to sleep medications alone
- Difference-in-difference analyses showed facility reductions ranging from 29% to 192%
- Number-needed-to-treat ranged from 6-7 for hospitalizations, HOPD and ER visits

REFERENCES

- Wickwire EM, et al. Untreated insomnia increases all-cause health care utilization and costs among Medicare beneficiaries. *Sleep*. 2019;42(4).
- <https://www.rxsaver.com/blog/how-to-treat-insomnia-with-medications>
- <https://www.debt.org/medical/emergency-room-urgent-care-costs/>
- <https://www.medpagetoday.com/publichealthpolicy/healthpolicy/26086>
- <https://www.hcupus.ahrq.gov/reports/statbriefs/sb261-Most-Expensive-Hospital-Conditions-2017.jsp>
- <https://healthpayerintelligencenews.com/news/how-ambulatory-surgery-centers-lower-payer-outpatient-spending>

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