

## A Retrospective Cohort Study: Efficacy of Various Treatments in Addressing Sleep Disorders



Revolutionizing Health and Aging Through Better Sleep

AS SEEN ON:



# Efficacy of Various Treatments in Addressing Sleep Disorders: A Retrospective Cohort Study

**Table 1: Comparative Analysis of Sleep Disorder Treatments**

Sleep Disorder Type	CPAP Group Improvement	Myofunctional and Breathing Therapy Improvement	Healthy Sleep Program (2 months) Improvement	Healthy Sleep Program (4 months) Improvement	Full Healthy Sleep Program (6 months) Improvement
Unaware of Sleep Disorders	Not used	60-80% (10% adherence)	90-97%	90-97%	90-97%
Mild Sleep Disorders	Not applicable	50-70% (20% adherence)	90-94%	90-95%	90-96%
Moderate Sleep Disorders	Not applicable	40-70% (40% adherence)	82-90%	85-92%	90-96%
Severe Sleep Disorders	30-60%	40-60% (60% adherence)	50-75%	65-89%	85-94%

## Explanatory Notes:

The study includes a large sample size (744 patients) over a long period (2014 to 2024), providing robust data for analysis.

## Treatment Methods:

- **CPAP:** Continuous Positive Airway Pressure therapy
- **Myofunctional and Breathing Therapy:** Consists of Myofunctional and Breathing exercises conducted for 30 minutes per day for 3 months in group and personal sessions.
- **Healthy Sleep Program:** Includes 1 oral device for night and 1 for day use, personal assistance with developing proper sleep hygiene, and a smart version of myofunctional and breathing therapy (7 minutes) 7 times per week. The program was offered in three variations:
  - Full Healthy Sleep Program: 6 months of support
  - 4-month Healthy Sleep Program
  - 2-month Healthy Sleep Program

### **Oral Device Functions:**

- Proper Jaw Alignment
- Teeth Grinding Prevention
- Muscle Tension Suppression
- Increased deep sleep phase
- Jaw Joint Relaxation

### **Effectiveness Notes:**

- Percentages indicate improvement in sleep indicators and quality of life
- Shorter versions of the Healthy Sleep Program may result in periodic declines due to incompletely developed sleep hygiene and myofunctional habits

### **CPAP-specific Notes:**

- Not used or applicable for milder cases
- For severe cases, 90% of patients complain about discomfort, and most cannot use the device all night
- May increaseTemporo-Mandibular Joint (TMJ) dysfunction in some patients

### **Sleep Disorder Severity Classification:**

The classification of sleep disorder severity was based on a combination of objective measures and patient-reported symptoms. The following criteria were used to categorize patients:

- **Unaware of Sleep Disorders:**
  - Minor changes in sleep indicators detectable by sleep tracker or somnography
  - Patient does not report any sleep-related complaints
  - No perceived health deterioration or daytime impairment
  - May have compensatory abilities that mask sleep disturbances
- **Mild Sleep Disorders:**
  - Occasional difficulty falling asleep or staying asleep
  - Minimal daytime impairment
  - Mild snoring without significant oxygen desaturation

- **Moderate Sleep Disorders:**
  - Frequent difficulty falling asleep or staying asleep
  - Noticeable daytime impairment
  - Moderate snoring with occasional oxygen desaturation
- **Severe Sleep Disorders:**
  - Chronic difficulty falling asleep or staying asleep
  - Significant daytime impairment affecting quality of life
  - Loud snoring with frequent oxygen desaturation
  - Presence of comorbidities such as hypertension or type 2 diabetes

## Overall Goal of the Healthy Sleep Program Development

The development of the BioAligners and the Healthy Sleep Program was driven by a vision to revolutionize sleep health integration in various medical settings. This innovative approach recognizes sleep as a fundamental pillar of overall health, impacting nearly all human functions including cognitive performance, emotional regulation, physical recovery, and long-term health outcomes. The key objectives were:

1. **Holistic Health Integration:** To promote a comprehensive approach to health that places sleep at its core, recognizing its crucial role in various medical contexts such as addiction treatment, mental health, cancer care, and neurodegenerative diseases.
2. **Accessibility and Versatility:** To create a system easily integrated into existing medical structures across different specialties, from rehabilitation centers to mental health clinics, without requiring extensive specialized resources.
3. **Empowering Healthcare Professionals:** To develop a method that can be implemented by various healthcare professionals, reducing reliance on sleep specialists and broadening the availability of effective sleep interventions.
4. **Enhancing Deep Sleep:** To focus on improving the deep sleep phase, acknowledging its critical role in physical restoration, cognitive function, and overall health.
5. **Reducing Barriers to Implementation:** To offer a solution that fits into existing healthcare frameworks, minimizing the need for specialized sleep departments and making quality sleep care a standard component of holistic patient treatment.
6. **Addressing Multiple Health Conditions:** To leverage the far-reaching effects of improved sleep in treating a wide range of conditions, including addiction, hormonal imbalances, depression, and chronic diseases, recognizing sleep's role as a powerful mediator of health and recovery.

## Adherence Rates and Patient Education

Our study revealed significant variations in adherence rates across different treatment modalities, particularly for Myofunctional and Breathing Therapy. The adherence rates observed were:

- Unaware of Sleep Disorders: 10% adherence
- Mild Sleep Disorders: 20% adherence
- Moderate Sleep Disorders: 40% adherence
- Severe Sleep Disorders: 60% adherence

The primary reason identified for low adherence was a lack of patient motivation and difficulty in recognizing the long-term benefits of the program. This finding underscores a critical gap in patient education regarding the importance of quality sleep.

Interestingly, adherence rates increased with the severity of sleep disorders, suggesting that patients experiencing more severe symptoms may be more motivated to engage with their treatment due to the noticeable negative impacts on their daily lives.

These observations highlight the value of the Healthy Sleep Program's holistic approach, which combines interventions with comprehensive education on sleep hygiene and the far-reaching impacts of quality sleep on overall health, cognitive function, and quality of life. By addressing both the physical aspects of sleep disorders and the crucial elements of patient education and motivation, the Healthy Sleep Program aims to achieve better adherence rates and, consequently, superior outcomes across all severity levels of sleep disorders.

The stark contrast between the adherence rates for Myofunctional and Breathing Therapy alone versus the high effectiveness rates of the full Healthy Sleep Program emphasizes the importance of a comprehensive, education-inclusive approach to sleep health. This finding reinforces the innovative nature of the Healthy Sleep Program and its potential to revolutionize sleep health treatment by ensuring patients are well-informed, motivated, and fully engaged with their treatment plan.

### Methodology:

Patients were assessed using polysomnography, actigraphy, myograph and validated sleep questionnaires (e.g., Pittsburgh Sleep Quality Index, Epworth Sleepiness Scale) to determine their sleep disorder severity. The classification was performed by sleep specialists blinded to the treatment assignment. The Healthy Sleep Program was tailored in duration and intensity based on the severity classification, with longer and more intensive interventions provided for more severe cases.

### Efficacy Measurements:

Sleep indicators were measured using a combination of objective and subjective measures:

- **Objective measures:**
  - Total sleep time

- Sleep efficiency
  - Deep sleep duration
  - Oxygen saturation levels
  - Respiratory rate
  - Muscle tension (EMG readings)
- **Subjective measures:**
    - Sleep onset latency
    - Number of nocturnal awakenings
    - Feeling of restfulness upon awakening
    - Daytime sleepiness

#### **Quality of Life Improvements:**

Quality of life was assessed using standardized questionnaires focusing on:

- Daytime fatigue
- Anxiety level
- Mood and irritability
- Cognitive function
- Work productivity
- Social relationships
- Overall life satisfaction

The percentage of patients reporting significant improvement was calculated based on clinically meaningful changes in these questionnaire scores.

#### **Key points from the study:**

1. The Healthy Sleep Program shows high effectiveness across all severity levels of sleep disorders, with improvements ranging from 50% to 97% depending on the severity and duration of the program.
2. The full Healthy Sleep Program (6 months support) consistently shows the highest improvement rates across all severity levels.

3. Shorter durations of the Healthy Sleep Program (4 months and 2 months) still show significant improvements but may lead to periodic declines due to incompletely developed sleep hygiene and myofunctional habits.
4. CPAP treatment is not applicable or less effective for mild and moderate cases, and shows limited effectiveness with comfort issues for severe cases.
5. Myofunctional and Breathing Therapy alone shows moderate effectiveness but suffers from low patient motivation and adherence.
6. The full 6-month Healthy Sleep Program consistently demonstrates the highest improvement rates and quality of life enhancements across all severity levels.

### **About the Study**

This retrospective cohort study was conducted by Health InnoTech, a pioneering company in sleep health solutions.

### **About Health InnoTech**

Health InnoTech is dedicated to revolutionizing sleep health through innovative, noninvasive solutions. Our mission is to enhance overall well-being by addressing the root causes of sleep problems with scientifically-proven products.

### **Contact Information**

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For more information about our Healthy Sleep Program or to discuss potential collaborations, please don't hesitate to reach out.