SINGLE-BLIND RANDOMISED TRIAL

Hydrogen-oxygen inhalation and sleep quality

A seven-day clinical study in adults with sleep disorders, published online in 2025 and in Medical Gas Research, Volume 16 (2026).

The research question

Could short-term nasal inhalation of a hydrogen-oxygen gas mixture improve measured sleep, perceived sleep quality and mood compared with control gas?

Study at a glance

66 adults

Participants had sleep disorders and were randomised between two groups.

Seven days

Nasal gas inhalation was administered during a short treatment period.

Hydrogen-oxygen group

Participants inhaled the active hydrogen-oxygen gas mixture by nasal cannula.

Control group

Participants inhaled air using the comparison procedure.

How sleep and mood were assessed

The study combined an Actiwatch wearable monitor with three questionnaires: the Pittsburgh Sleep Quality Index (PSQI), Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS).

Why the Actiwatch matters

It provided objective estimates of total sleep time, sleep efficiency and wake time, complementing the participants' self-reported experience.

MAIN RESULTS

Objective sleep measures improved during the short trial

Increased

TOTAL SLEEP TIME

Improved on days 3, 5 and 7 in the active group.

Improved

SLEEP EFFICIENCY

More recorded sleep relative to time in bed on days 3, 5 and 7.

Reduced

WAKE TIME

Lower on days 3 and 7 in the active group.

Comparisons with the control group

Actiwatch outcomes

Compared with control, the hydrogen-oxygen group had greater total sleep time and lower wake time. The control group showed no significant changes in its sleep parameters during treatment.

Questionnaire outcomes

After seven days, PSQI sleep-quality and SDS depression scores were lower in the hydrogen-oxygen group than in control. Lower scores indicate fewer reported difficulties on these scales.

Anxiety

Self-Rating Anxiety Scale scores were not significantly different between groups.

What the results do not establish

The study did not demonstrate long-term remission of insomnia, improved daytime functioning, reduced medication use or effectiveness for specific causes such as obstructive sleep apnoea, restless legs syndrome or circadian rhythm disorders.

Bottom line from the findings

The combination of wearable and questionnaire data makes this an interesting early signal. The seven-day duration means persistence, clinical importance and optimal dosing remain unknown.

EVIDENCE IN CONTEXT

Promising short-term findings that need independent confirmation

Key limitations

- **Short duration**
  Seven days is insufficient to know whether improvements persist after treatment or translate into meaningful long-term benefit.
- **Small sample**
  Sixty-six participants can identify an early signal, but larger trials are needed for reliable effect estimates and subgroup analysis.
- **Single-blind design**
  Not everyone involved was blinded, increasing the possibility that expectations or study conduct influenced some outcomes.
- **Broad sleep-disorder label**
  Sleep problems have many causes. Results should not be generalised automatically to diagnosed insomnia, sleep apnoea or other specific disorders.
- **Actiwatch is not polysomnography**
  Wearable actigraphy is useful but does not measure sleep stages, breathing events or brain activity like a full sleep study.
- **Commercial affiliation**
  Two authors were affiliated with Jinkai Instrument (Dalian) Co., Ltd.; independent replication would strengthen confidence.

Balanced conclusion

Hydrogen-oxygen inhalation was associated with improved objective and self-reported sleep outcomes over seven days. Larger, double-blind trials with longer follow-up and clearly defined sleep diagnoses are required before it can be considered an established sleep treatment.

Original study

Gao YH, Chen J, Zhong H, Zhao Q. Effect of hydrogen-oxygen inhalation on sleep disorders and abnormal mood: a single-blind, randomized controlled trial. Medical Gas Research. 2026;16(2):98-102. DOI: 10.4103/mgr.MEDGASRES-D-25-00020.

READ THE FULL STUDY

PubMed PMID: 40826930 | ChiCTR2400084103

HEALTH NOTE

Persistent poor sleep, loud snoring, gasping, breathing pauses or severe daytime sleepiness require clinical assessment. Hydrogen inhalation should not replace CBT-I, CPAP, prescribed treatment or investigation of an underlying sleep disorder.