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Case Study

# Orthosomnia: Is it the New Sleep State Misperception Experience?

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## Abstract

A case study of a seventy-two year old female referred to the Insomnia clinic for a longstanding sleep disturbance is presented. The incidence of sleep disturbance in the older adult population is common. A typical onset following retirement from the structure of a work schedule and/or transition away from child/family member in-home care. A common co-existing issue with sleep disturbance in this population is the increased incidence of medical conditions and use of prescribed medications. A clinical history of the patient's sleep and general health was followed by the completion of standard measures of the Pittsburgh Sleep Quality Index and the Epworth Sleepiness Scale. The patient was provided with an explanation of CBTi and requested to begin tracking her sleep using a standard sleep log form. In addition, per the patient's request, data was included from wearables that she was using. Wearables are commonplace today, but the link to empirical utility and impact on the patient is at present understudied. A summary of the interview and standard scales findings is presented, as well as weeks one and two of the baseline sleep logging. The focus of this article is the patient's response to the wearable data and her experience reporting her sleep. The patient continued to CBTi treatment following the assessment, and the baseline was reported to her. For a description and details about CBTi, consult Sexton-Radek and Graci.

**More Information**

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The sleep of older adults is often presented as disturbing. With the transition from work world schedule, home and family responsibilities to leisure time, many older adults continue to maintain an expectation of their typical sleep time. The transition may be a time of some uncertainty while the use of time, financial security, and the development of new behaviors for socializing ensues. Sleep is determined by the homeostasis of sleep need and circadian rhythm demands on the individual. With the lifestyle changes, some individuals alter the regular sleep-wake cycle with early bedtimes, napping, and the extension of waketimes, thus defying the physiological entrainment of sleep. Cognitive behavioral therapy interventions(CBTi)for sleep address these issues with the provision of the basics of sleep, good sleep habits, and the suggestion of regular wake-up times and reduced daytime sleep. These outcomes of CBTi are straightforwardly communicated in a brief therapy manner of some three to six sessions with follow-up. This circumstance has taken on an additional component with the increased popularity of smartwatches, smart rings, and other devices that are worn with the internal workings of a movement accelerometer and proprietary software, tracking sleep and health variables. The popularity has led to not only several devices but also varying price points for individuals to consider.

The value and expectations that individuals place on the digital metrics of their health are new to empirical investigation efforts. Further, the comparison of the digital metric to the lived experience has received only a paucity of scientific attention despite the high volume of "wearable" users. The discrepancy between the digital and lived experience, the dependence on the digital metric, has led to some false embodiments and, for some, an overriding focus on the digital data and their self-perception. In effect, as the case study person stated in the initial interview, "I must be sleeping poorly with the awful numbers my watch is telling me!"

With the popularity and capability of wearables increasing, for example, digital measurements of blood glucose level and alcohol intake, individual use of devices is expected to increase. In addressing the link between the digital record and lived experience, self-report studies have focused on the measurement of anticipated increased self-awareness of one's health and self-conscious levels. For example, personality assessment studies have identified increased use of wearables

and acceptance of digital data in those with increased openness and female adults. In an investigation of the value of the smartwatch to the person, the introduction of the health care provider moderating the digital record led to more favorable use and increased compliance. Further, in those participants scoring low on motivation for self-care of health, the use of a wearable nudged the grouping to a statistically significant level of compliance for adopting good sleep habits because of the wearable use. Sleep tracking has been found to increase self-awareness. For some, the setting of goals for behavioral change to improve their sleep health stemmed from the user-centered perspective of wearable sleep tracking [1-8].

A seventy -two year old female presented to the Insomnia clinic with poor sleep quality. Informed consent was obtained. Her elevated score on the Pittsburgh Sleep Quality Index [9] indicated difficulty falling back to sleep, daytime napping, and difficulty maintaining sleep. While the sleep disturbance history was over sixteen years, the recent two years were reported to be the most severe by the patient. The patient reported medical conditions of seizure disorder, high blood pressure, high triglycerides and cholesterol levels, and shoulder arthritis from a forty-year work history as a laboratory chemist leaning forward at a lab table for her work. The patient followed a prescribed medication regimen for her medical conditions. The patient was married, and the couple had a young adult son who lived independently. The patient stated that she spends her time gardening during mild weather, shopping, bible study groups, watching television, and crocheting. She denied environmental factors of noise, light, and temperature impeding her sleep. She stated that she and her husband had three regular meals, and she walked one to two miles, weather permitting. The patient denied tobacco, alcohol, or recreational drug use. She denied stress, recent disappointment, or strife. Daytime sleepiness (Epworth Sleepiness Scale) was not significant. The patient commented that she was puzzled about how alert she felt in the day despite her terrible sleep. The patient reported taking an hour-long nap each afternoon after lunch as she sat in a chair in front of the television. She followed this nap with a walk, weather permitting. Following a description of the sleep log form, the patient was requested to track their sleep for two weeks. This two-week baseline was planned for the use of setting the CBTi treatment. Table 1 illustrates the sleep log form and wearable data recordings, on average, for week one and week two of the baseline interval. The patient stopped using the first wearable as she thought it overcounted the number of wakeups and the time that she was awake. She wanted to stop the second wearable she moved to, as it seemed more extreme in counting wake-ups and wake-up times, but was constrained by the subscription agreement without a refund, so she continued using the wearable. The patient expressed how poor her sleep was and that the wearables, which she assumed were more accurate than her recall of her lived experience. The unfavorable values of both wearables influenced the patient to comment, reflecting her beliefs about how compromised her sleep is. This self-awareness led to considerable frustration as she felt she was complying with all good sleep habits, and compared to her sleep record, the digital records were reporting a more intense sleep disturbance. This self-awareness becomes an impairment in the therapeutic process in that she declined the gentle nudging to discontinue the wearable recording of her sleep despite it inciting negative reactions. While the enhanced self-knowledge of her sleep acknowledged her commitment to striving for good health, the results from the digital recordings dampened this outcome considerably.

In Table 1, the discrepancy between sleep variables from the sleep log form and the wearables was apparent in each variable. The validity and reliability of wearables, as well as the often difficult-to-discover proprietary indices of sleep variables, complicate this situation. The absence of the perceived change in her sleep to a more disturbed level was alarming to the patient. Following this assessment interval of two weeks baseline of sleep, it was determined to begin CBTi and to stop use of the wearable. However, the patient has been compliant with the sleep log form and continued use of the wearable, with comments about how the digital record does not seem right to her. Continued efforts are planned to request the patient to stop wearable use as the increased self-knowledge is negative, and the consequences of the digital findings have proven to be problematic for this patient.

**Table 1:** Sleep Log Form and Wearable Sleep Recordings for Baseline.

| | Week 1 | | Week 2 | |
|---|---|---|---|---|
| Variables | Sleep Log | Wearable | Sleep Log | Wearable |
| Bedtime (BT) | 9:45 PM | 9:30 PM | 9:45 PM | 8:15 PM |
| Time to Sleep Onset (SO) | 5 min | 27 min | 5 min | 13 min |
| Wake After Sleep Onset (WASO) | 4 | 6 | 3 | 7 |
| Wake Time (WT) | 8:00 AM | 2:30 AM | 7:15 AM | 4:00 AM |
| Napping | 1 hr | 1 hr 45 min | 1 hr | 2 hr 10 min |

Note: Wearable 1 was discontinued due to patient dissatisfaction; Wearable 2 continued despite dissatisfaction as the patient was locked into a non-reversible subscription.

## Conclusion

It is advised, based on the clinical work with this client, that an individual approach with the use or non-use of wearables for best practice be considered. If the results are not contributing in a positive, constructive manner for the patient, then the utility of the wearable is in question and should be evaluated.

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