



Searching for novel non-medical remedies for insomnia: Is neurobics a possibility?

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1. Aim: To explore the neurobic basis of Yoga & Meditation therapies for insomnia.

2. Background:

- Increased sleep latency is a common reason for in-alertness during medical residencies, seen in 68.4 % of residents, n=1205, (AlSaif *et al*, 2019).
- Yoga therapies are less commonly used for insomnia due to the requirement of intense training.
- Brief models have been examined for busy professions (Winter, 1981) but have not been systematically studied.
- Neurobics are short exercises that use cognition & 5 physical senses in non-regular ways (Napatpiyator *et al*, 2019)
- Pranayama & Anapanasati (PA) are breathing practices from Yoga & Buddhist meditation respectively; both use the neurobic model ie work on breathing in the former & observing sensations with focussed breathing in the latter.
- In the Yogic & Meditational literature, neurobic adaptation has been found evidential for emotional health (Tiwari *et al*, 2018); benefits in insomnia have been mentioned but no such detailed discussion exists.
- PA techniques are easy to learn & follow, unlike regular yoga. The counterpart models: Kundalini yoga and Vipassana meditation have demonstrated a sleep-promoting potential (Chaudhari *et al*, 2020), (Maruthai *et al*, 2016).
- Neurobics have been mostly studied longitudinally and have been found to be helpful in psychiatric conditions eg anxiety & depression (Raj *et al*, 2020).

3. Hypothesis

The role of neurobics in emotional disorders could be suggestive of sleep as a contributory factor. There are no studies on the instant effect of neurobics; they could be sleep-inducing by way of briefly exhausting the human brain.

4. Methods:

- Two books and 5 articles on Neurobics, 2 books and 3 articles on Pranayama Yoga & 2 books and 3 articles on Vipassana Meditation (mother entity of Anapanasati) were reviewed.
- Keywords: *insomnia, neurobics, yoga, meditation, pranayama, anapanasati* were used.
- The mechanics of PA for insomnia was explored and the possibility was compared with that of neurobics.

5. Results:

- Four studies associate the modalities of yoga and neurobics however, only briefly touch on the topic of sleep.
- Four articles and 1 book on neurobics mention the term 'sleep' several times, but no specific mechanism is given.
- Specific neurobics which follow the PA methodology could be visualized as: Bhramari (*sound*), Shitali (*taste*), Anulom (*smell*), Ana Pana (*touch*), Sati (*emotional awareness*); **vision sense can not be utilized for sleep initiation.**
- The neurobic model of PA maximizes perceptual work which could be beneficial in sleep induction.
- Example: gustation with tongue alone and olfaction in absence of fragrance where saliva and natural air are the respective stimuli, is a sensory work in itself. With repeated mental maneuvering, the process could be exhaustive enough to induce sleep.
- The review findings resonate with the hypothesis on 'neurobics as a possible remedy for insomnia'.

6. Discussion:

- Existing literature has neurobiological evidence of increased BDNF through neurobics. The mechanism is illustrated as challenging the brain, *just like reading & meditation*, in innovative ways. As these activities have a somnifing propensity, the relevance of neurobics in producing sleep can be imagined. We explored this possibility and found that PA relax the brain toward sleep.
- The research divides neurobics into a cognitive and perceptual framework. Examples of such tasks are attentive counting((cognitive) & observation of sensations (perceptual). Per this review, neurobics may also be categorized into active: *performing* tasks (stimulative) vs passive: *appreciating* tasks (soporific).
- For sleep induction, the passive tasks are more appropriate because the brain should not engage for activation while preparing for a drowse. However, the cognitive tasks may be relevant for N3 (deep sleep).
- Our pilot study also emphasizes the 'passive' mode and hypothesizes that PA have a definite relaxing effect which is the pathway toward sleep, however, mind-body easing breath has to be paired with the cognitive acts (eg. keeping track of each neurobic cycle by counting and shifting from one to another application) to complete the novel model.
- The tasks need to be memorized and repeated by subjects, therefore the model is recommended to individuals with at least an average IQ (80-100). The motivation for sleep hygiene is essential but a diagnosis of insomnia is not mandatory for trying the technique. For patients with acute psychiatric illnesses, the design may not be of significant value. Also, people with respiratory problems may not be ideal candidates as breathing regulation may aggravate respiratory exhaustion.

7. Conclusions:

A blended model of neurobics may have the potential to relieve insomnia. Population wary of hypnotics use may particularly benefit from this. Brief & adaptable PA techniques can be suitable during residency training.

8. References:

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