

Behavioural approaches to treating insomnia, snoring, and obstructive sleep apnoea

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"Sleeping is no mean art: for its sake one must stay awake all day."

- Friedrich Nietzsche (1844 – 1900)

People who suffer from insomnia usually describe difficulty with falling asleep and, less commonly, difficulty maintaining sleep, or a perception that their sleep is unrefreshing. Insomnia often results in daytime fatigue, general malaise, and, in severe cases, cognitive and mood disturbances.

Cognitive Behavioral Therapy (CBT) for Insomnia

The CBT approach for treating insomnia (often called CBT-I) is directed at changing sleep habits and scheduling factors, as well as misconceptions about sleep and insomnia. There is compelling evidence supporting the effectiveness of CBT in treating insomnia. The main techniques used are: stimulus control, sleep hygiene, sleep restriction therapy, cognitive restructuring and reducing sleep interfering mental arousal.

Stimulus control involves the therapist looking at the client's sleep habits and pinpointing different actions that may be prohibiting sleep e.g. spending time in their bedroom when unable to sleep, instead of leaving the bedroom and not returning until they are ready to sleep. Stimulus control involves viewing the bedroom as being reserved for sleep, sex, and dressing only.

Sleep hygiene refers to various behavioural and environmental recommendations that promote healthy sleep. These include: (a) minimising the amount of light, noise, and temperature change in the bedroom, (b) limiting the quantity of stimulants consumed during the day, especially close to bedtime, (c) avoiding vigorous exercise during the two hours before bedtime, (d) avoiding eating large meals close to bedtime, (e) avoiding bedtime activities not related to sleep

Sleep restriction therapy limits the amount of time spent in bed to increase the biological need for sleep at night. This process usually starts by restricting the time spent in bed to the amount of time estimated that one should spend sleeping. For example, a person stays in bed for about 9 hours but only sleeps for about 6, will initially restrict time in bed to 6 hours. This initially causes mild sleep deprivation but the sleepiness it creates trains the body to fall asleep more quickly.

Cognitive restructuring involves using the cognitive aspect of CBT to reduce mental arousal by helping patients shift from 'trying hard to sleep' to 'allowing sleep to happen.' In using cognitive restructuring clients identify, challenge and replace dysfunctional sleep related thoughts with more functional sleep related thoughts.

Reducing sleep interfering mental arousal involves the use of a variety of relaxation techniques to reduce sympathetic nervous system activity and enhance parasympathetic activity.

Snoring and obstructive sleep apnoea (OSA)

Snoring is very common, and often relatively harmless. Nearly everyone snores at some time or another. Occasional light snoring is at worst, is a minor annoyance. However, loud and habitual snoring can disrupt a person's sleep and may be a sign of a much more serious sleep disorder i.e. obstructive sleep apnoea (OSA).

The well known snoring sound is a sign that the snorer's airway is partially blocked, usually by soft tissue in the throat. The flow of air causes the soft tissue to vibrate, generating the distinctive noise, which comes out of the nose, mouth or both. It is estimated that approximately 40% of men habitually snore and 24% of women. An estimated 10 to 20% of children snore. Overweight and obese people tend to snore because there is more fat tissue in the back of their throats.

In some cases, snoring is a symptom of OSA. OSA occurs when part of the airway is closed off (usually at the back of the throat) while a person is trying to inhale during sleep, and breathing stops for more than 10 seconds before resuming again. People with severe OSA can have hundreds of episodes of apnoea each night. In many cases, OSA is undiagnosed because sufferers often mistake this serious disorder as snoring.

OSA is common and potentially lethal. The resulting low oxygen in the blood stream awakens the sufferer, resulting in disrupted sleep, even though they do not fully remember awakening. OSA represents a major risk factor for cardiovascular disease. Research indicates that OSA is associated with a 68% increase in coronary heart disease in men. OSA may also be associated with increased cholesterol, hypertension, stroke and death, cancer mortality and type 2 diabetes.

Despite the effectiveness of continuous positive airways pressure (CPAP) in treating OSA, adherence to therapy continues to be a major problem. A study published in the journal *Sleep* found that only 40% of 162 newly diagnosed patients who required CPAP therapy accepted the treatment. Other researchers have found that failure to comply with treatment has been reported to be as high as 50%, with patients typically abandoning therapy during the first 2 to 4 weeks of treatment.

Behavior modification therapy for snoring and sleep apnoea

Behavior modification therapy involves providing recommendations to help alleviate the collapse of the airway, to help the patient sleep better. The main recommendations are:

- (a) Exercise and lose weight to reduce Body Mass Index (BMI) to under 25 and to reduce fat in the neck area
- (b) Avoid alcohol, caffeine and heavy meals, especially within two hours of bedtime.
- (c) Change sleeping position from sleeping on the back to sleeping on the side

- (d) Use contoured pillows to elevate the body from the waist up, so as to maximize airway space.
- (e) Sew a tennis ball into the back of a night shirt to prevent sleeping on the back
- (f) Give up smoking because it is believed to contribute to sleep apnoea
- (g) Avoid sedatives, especially before bedtime because they relax the muscles in the throat and interfere with breathing
- (h) Oropharyngeal exercises derived from speech therapy may be an effective treatment option for patients with moderate OSA.

The most beneficial behaviour change of all

As previously mentioned, OSA is a major risk factor for cardiovascular diseases. Changing an OSA sufferer's breathing behaviour is probably, by far, the most important behavioural change that can improve their cardiovascular health and stop their snoring and/or OSA. To explain why, a little background history follows..

In 1978, Professor Robert Furchgott discovered an important compound in the endothelial cells that relaxes blood vessels. He named it endothelium-derived relaxing factor (EDRF). Some years later, he determined that EDRF was in fact nitric oxide (NO). In 1998, he and two other researchers were jointly awarded a Nobel Prize "for their discoveries concerning nitric oxide as a signalling molecule in the cardiovascular system".

Further research confirmed that NO is a molecule of key importance for the cardiovascular system. It was also found to exert a series of other functions. It is now known that NO acts as a regulator of blood pressure and blood flow to different organs. When NO is produced by the the endothelium, it rapidly spreads to the underlying muscle cells and their contraction is switched off by NO, resulting in a dilatation of the arteries. In this way, NO controls the blood pressure. It also prevents the formation of thrombi.

In atherosclerosis, the endothelium has a reduced capacity to produce NO. However, in 1995, Dr. Jon Lundberg discovered that the paranasal sinuses are powerful producers of NO. Since the sinuses create a high concentration of NO, when breathing is done through the nose; NO travels down the airway to the lungs. Lundberg showed that arterial oxygenation increases significantly during nasal breathing, compared to oral breathing.

A review of the literature reveals that NO:

- Is a primary regulator of blood pressure
- Prevents the formation of potentially dangerous blood clots
- Prevents the muscle cells in artery walls from multiplying and thickening (a factor in atherosclerosis)
- Protects the endothelium by preventing the adhesion of substances that initiate atherosclerosis
- Is a potent vasodilator - it increases blood flow and reduces the amount of work the heart has to do
- Lessens the oxygen requirements of the myocardium and relieves angina

Hyperventilation is a significant factor in OSA. This leads to an excessive loss of carbon dioxide. According to the physiological phenomenon called the Bohr Effect, this results in haemoglobin proteins offloading less oxygen, resulting in decreased oxygenation of tissues and organs. Essentially, this means that mouth breathing OSA sufferers (and mouth breathers without OSA) could significantly improve their cardiovascular health by

undertaking breathing exercises which can change their breathing to nasal breathing and correct hyperventilation. This can be achieved by use of a breathing behaviour change approach originally developed in Russia, which is now increasingly being used in the 'Western' world. Through use of this technique, thousands of sleep apnoea sufferers have been able to wean themselves off using CPAP machines.

This breathing behaviour change approach is called the Buteyko Method. One of the world's leading Buteyko experts is an Irish man called Patrick McKeown. I would highly recommend his book titled 'Sleep with Buteyko' to anyone who suffers from obstructive sleep apnoea, snoring or insomnia. Details of Patrick's forthcoming Buteyko courses can be found on: www.snoring.ie

Interestingly, the following quotation from the Bible can be interpreted as indicating the vital importance of nasal breathing:

"And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul". - Genesis. 2:7

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