



BIOFEEDBACK THERAPY

Nursing

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ABSTRACT

A new interdisciplinary paradigm emerged throughout the late 1960s, unifying developments from the fields of psychology, neurophysiology, cybernetics, and medicine. On October 1969 the Biofeedback Research Society was formed, held's the first meeting in Santa Monica, and the phenomenon of biofeedback officially received its name. Biofeedback is the only technique can help you gain control over the involuntary functions, it's helpful in changing the unhealthy habits by interpreting factors such as electric brain activity and it's often offered with relaxation training. There are five types of methods of biofeedback are being practiced and two types of device are used in gathering information, like Interactive computer programs or mobile devices and wearable devices, the sessions usually last less than one hour, in some conditions, patients experience relief in eight to ten sessions and in some few conditions, like high blood pressure, improvements may take twenty sessions. It is also helpful in treating migraine headaches, attention deficit hyperactivity disorder, post-traumatic stress disorder, urinary incontinence, and some other conditions. Biofeedback is generally a safe form of therapy and no negative side effects have been reported.

KEYWORDS

Biofeedback, Electroencephalogram, Electromyogram, Thermal biofeedback, Galvanic skin response, Heart rate variability, Mobile devices, Wearable devices

INTRODUCTION

Biofeedback is the only technique can help you to gain control over the involuntary functions. The idea behind the biofeedback is that, by exploiting the power of your mind and identifying what's going on inside your body, you can gain more control over your health. The patients learn to control bodily processes which are normally involuntary, like muscle tension, blood pressure, and heart rate. It's also helpful in various conditions, such as chronic pain, urinary incontinence, high blood pressure, tension headache, and migraine headache. Biofeedback is a non-invasive procedure; no medication is involved in it and low risk of side effects. It is useful for those who wish to avoid medications or those who cannot use them, such as during pregnancy. It is often offered with relaxation training.

History of development

A new interdisciplinary paradigm unfolds throughout the late 1960s, unifying developments from the diverse fields of psychology, neurophysiology, cybernetics and medicine ends in a number of key publications in the final year of the decade. In 1969 Neal Miller published an article in *Science* on the "Learning of Visceral and Glandular Responses." Elmer Green was a senior author for two classic articles in the same year "Self-Regulation of Internal States" (in *Proceedings of the International Congress of Cybernetics*), and "Feedback Technique for Deep Relaxation" (in *Psychophysiology*). Charles Tart also published his edited compendium *Altered States of Consciousness* (Tart, 1969), including several articles on feedback techniques or operant conditioning modifying Neuro-physiological actions.

In the same year, key publications in systems theory and cybernetics gave wider distribution to new concepts of feedback within systems, which were to be so critical in understanding self-regulatory events. Ludwig Van Bertalanffy contributed a chapter to *General Systems Theory and Psychiatry* (1969).

"Biofeedback" as a model and technique:

A scientist applies sensitive electronic instruments to provide meaningful data about physiologic processes to an animal or human subject. In turn, the subject gains greater awareness and control over the physiology and self-regulates more effectively. Bio-feedback, the providing of information back to a subject about life processes contributes a powerful new tool for self-mastery, research, and clinical intervention.

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Mechanism

- Biofeedback therapy helps people to change unhealthy habits by interpreting factors such as electric brain activity.
- During a biofeedback session, the therapist places electrodes on the patient's skin; Finger sensors can also be used.
- These electrodes, /sensors send signals to a monitor, which displays a sound, flash of light, or image that is your heart and respiration rate, blood pressure, skin temperature, sweating, or muscle activity and you can visualize these stress responses on the monitor, and can get immediate feedback as you try to stop them.
- The therapist views the appraisal on the monitor and identifies a range of mental activities and relaxation techniques that can help to regulate the patient's bodily acknowledgment Eventually, patients learn how to control these processes without the use of monitoring
- Several relaxations exercises are used in biofeedback therapy, including:
 - Deep breathing exercises
 - Progressive muscle relaxation: Alternately tightening and relaxing different muscle groups
 - Guided imagery: Concentrating on a specific image (color and texture of fruit) to focus your mind and make you feel more relaxed
 - Mindfulness meditation: Focusing your thoughts and letting go of negative emotions

Types

- **Electroencephalogram (EEG):** An EEG monitors the activity of brain waves linked to different mental states such as wakefulness, relaxation, calmness, light sleep, and deep sleep. This process is also known as Neurofeedback.
- **Electromyogram (EMG):** This measure's muscle activity and tension, it's also used in for back pain, headaches, anxiety disorders, muscle retraining after injury, and incontinence.
- **Thermal biofeedback:** This measure's skin temperature and used for headache and Raynaud's disease.
- **Galvanic skin response training:** Sensors measure the activity of a person's sweat glands and the amount of perspiration on the skin, indicating the presence of anxiety, this information can be useful in treating emotional disorders such as phobias, and anxiety
- **Heart rate variability:** This measures heart rate; it also been used in anxiety, asthma, chronic obstructive pulmonary disease (COPD), and arrhythmias.

Biofeedback devices

You can receive biofeedback training in physical therapy clinics and hospitals. A growing number of biofeedback devices and programs also are being marketed for home use, including

• **Interactive computer programs or Mobile devices.**

Some types of biofeedback devices measure physiological changes in your body, such as your heart rate activity and skin changes, by using one or more sensors attached to your fingers or your ear. The sensors plug into your computer.

Using computer graphics, the devices help to manage stress by helping you to pace your breath, relax your muscles and think positive self-statements. Studies show that these types of devices might be effective in improving responses during stress and maintain a feeling of calm and well-being.

Another type of biofeedback therapy involves wearing a headband that monitors your brain activity while you meditate. It uses sounds to let you know when your mind is calm and when it's active to help you learn to control your stress response and the information from each session can be stored on your computer or mobile device so that you can track your progress over time.

• **Wearable devices.**

This involves wearing a sensor on your waist that monitors your breathing and tracks your breathing patterns using a downloadable app. The app can alert you if you're having prolonged tension, and it can offer guided breathing activities to help restore your calm.

Sessions

- Sessions typically last less than one hour.
- Some conditions, patients experience relief in 8 to 10 sessions, some conditions, such as high blood pressure, betterment may take 20 sessions
- Besides these sessions there will be mental and relaxation activities that the individual will accomplish at home for five to ten minutes per day.

During the procedure

- During a biofeedback session, a therapist attaches electrical sensors in different parts of the body. These sensors might be used to monitor brain waves, skin temperature, muscle tension, heart rate, and breathing. This information is fed back to you via cues, such as changes on a monitor, a beeping sound or a flashing light.
- The feedback teaches to change or control the body's reactions by changing thoughts, emotions, and behavior.
- For instance, biofeedback can accurately tense muscles that are causing headaches. You then learn how to make deliberate physical changes in your body, such as the body's specific muscles, to reduce your pain.
- The goal of biofeedback is to learn to use these techniques at home on your own.
- A typical biofeedback session lasts 30 to 60 minutes. The duration of the sessions can determine the condition and how fast you learn to control your physical responses.

Uses

- It remains unclear why or how biofeedback works, but it appears to benefit people with conditions related to stress,
- Biofeedback therapy teaches relaxation and mental exercises that can alleviate symptoms.

Migraine Headaches

- People often seek biofeedback and relaxation techniques to treat headaches and migraine, but studies into its effectiveness have produced mixed results.
- The Michigan Headache and Neurological Institute suggest that biofeedback therapy improves symptoms of headache and migraine in 40 to 60 percent of patients, similar to the success rate of medications.
- They propose that combining biofeedback with medication may increase the effectiveness of both.

Attention Deficit Hyperactivity Disorder

- Some studies have suggested that EEG biofeedback, or Neuro-feedback, may help people with ADHD.

Post-traumatic stress disorder

- Monitoring the body's reactions can help a person learn about their stress levels and how to reduce them.
- Some types of biofeedback therapy also may help patients with post-traumatic stress disorder

Other conditions

Electrodes pick up signals from different parts of the body. Interpreting these can give insight into various conditions and how to reduce their impact.

Other conditions that may benefit from biofeedback include:

- Back pain
- Depression
- Anxiety
- Asthma
- High blood pressure
- Diabetes
- Chronic pain
- Anorexia nervosa
- Learning disabilities
- Muscle spasms
- Motion sickness
- Biofeedback therapy can help to optimize performance in sports participants.

Follow-Up

- Once you finish your biofeedback sessions, you can return back to your therapist's room.
- If you are under a doctor's care, continue communicating with and seeing your doctor. All changes in your treatment plan should be made with the help of your doctor.

Risks

- "Biofeedback is an extremely costly and time-consuming treatment modality
- Biofeedback is generally a safe form of therapy.
- No negative side effects have been reported.

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