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Use of the Biofeedback Method in Sports and Pre-Competition Procedures

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Abstract. *Biofeedback is a psychological and physiological technique that involves the use of visual or auditory aids to teach people to recognize physical signs and symptoms of stress and anxiety, such as heart rate, body temperature, and muscle tension. With the help of biofeedback tool, athletes can understand the autonomic nervous system in advance and conduct standardized sports training. Feedback information, which not only significantly improves the body's ability to control the nervous system, but also ensures the health of athletes, lays the foundation for a good effect of exercise.*

Key words: *Thermal biofeedback, Neurofeedback, Electromyography.*

The Association for Applied Psychophysiology and Biofeedback defines biofeedback as a process that enables people to change their physiological activity in order to improve health or performance.

Using precise measuring devices, the user is provided with information about bodily functions. Providing this information often supports the desired physiological changes along with changes in thinking, feeling, and behavior. After a few sessions, the athlete can perform these techniques and use the equipment on their own. There are different types of biofeedback. That is, the exact approach that will be used depends on the recommendations of the therapist or psychologist .

Patients with heart rate variability wear a device connected to sensors placed on their ears or fingers, or on their wrists, chest or torso. There is some evidence that heart rate variability biofeedback may be useful for various conditions, such as asthma and depression.

Galvanic skin response, also known as skin conductance, is a type of biofeedback that involves measuring the amount of sweat on the surface of the skin. This type of biofeedback is useful for assessing emotional arousal. In addition to the obvious thermoregulatory function of sweat, emotional stimulation can also easily induce sweating. The more aroused a person is, the higher the skin conductance.

Blood pressure biofeedback involves the patient wearing a device that provides information about their blood pressure. These devices often guide the user through techniques that may include visual cues, breathing exercises, or music. Although these devices have become popular, one review of eight previous trials found no convincing evidence that this type of biofeedback has a long-term effect on hypertension. Thermal biofeedback (temperature feedback): In thermal biofeedback, patients wear sensors on their skin that detect blood flow. Because people often experience a drop in body temperature during times of stress, these devices may help people better identify when they are starting to feel overwhelmed. A low reading on one of these monitors may indicate the need for stress management techniques.

Methods. Biofeedback is generally considered a type of training rather than a treatment. With training and practice, biofeedback can be used to help people develop new skills that can help them cope or improve their performance A biofeedback session often lasts between 30 and 60 minutes. A typical course of treatment involves four to six sessions, although eight to ten sessions are not uncommon. The length of treatment and the number of sessions needed depend on many factors, including: How well you respond to the training The condition you are focusing on The goals of your treatment.

During a typical biofeedback session:

1. Electrical sensors are attached to specific areas of your body depending on the type of response being measured.

2. These sensors are connected to a measuring device that provides feedback on your physical responses.

3. During the session, your therapist will guide you through a variety of mental exercises, which may include visualization, meditation, breathing, or relaxation techniques.

As you perform these exercises, information about your physical response is collected from the measuring device. To be effective, biofeedback requires people to actively participate in the treatment. Success usually requires people to practice regularly between sessions [5].

Biofeedback is useful for managing stress and a variety of conditions that can increase stress, including:

1) Attention deficit hyperactivity disorder (ADHD);

2) Anxiety, depression;

3) Brain injury;

4) Irritable bowel syndrome (IBS);

5) High and low blood pressure;

6) Mental illness;

7) Physical reactions to stress, post-traumatic stress disorder (PTSD);

8) Relaxation and stress management or tension headaches.

Like other treatment approaches, biofeedback has its pros and cons. It may not be right for everyone, so you should weigh the benefits and risks before deciding if it is the best choice for your situation. So what might be the reason for using biofeedback?

Biofeedback may be used when other treatments have not worked or when people cannot take certain medications. Because biofeedback is non-invasive, patients may prefer it when other treatments would be more invasive or disruptive. It can complement other treatments.

Biofeedback training can also be used as part of a treatment approach. People often choose to use biofeedback to complement other treatments, including medications and relaxation strategies that can help manage emotions. Biofeedback also teaches people how to manage their reactions to stressful situations, which can help them gain self-control and better cope with the anxiety they may experience in their daily lives, as well as the stress of other medical conditions.

Biofeedback can have additional mental health benefits, including learning new ways to cope with anxiety and manage emotional reactions. Biofeedback training helps people take responsibility, control, and power over their own health.

Biofeedback training is the most effective method of psychological training. It is widely used in modern sports training. It is effective for training athletes and can serve as a basis for athletes to develop their own abilities.

Wang Huimin and several other researchers found that if the level of muscle tension and arousal is too high before the competition, it can reduce the performance of athletes. EMG linkage technology can effectively help athletes maintain a stable posture. It can relieve the tension of their body and muscles. Song Shuxian used EMG linkage to train archers for a certain period of time. It was found that after training, the archers and EMG values may decrease. The main working muscle can improve the stability of the movement from opening the bow to extending it.

Visceral functions controlled by the autonomic nervous system, such as smooth muscle tension in the blood vessels, trachea and intestines, breathing and pulse rhythm, are also effective. Related studies help athletes find the best trigger point by monitoring and observing various biofeedback [9]. Conclusion Biofeedback technology helps athletes to obtain information about the change of physiological indicators during competition and training. With the help of biofeedback tools, athletes can have a more accurate and understandable psychophysiological state. Understanding the autonomic nervous system in advance and conducting standardized sports training, information about thoughts and judgments, which not only greatly improves the body's ability to control the nervous system, but also ensures the health of athletes, and lays the foundation for a good effect of sports training. Biofeedback training can accelerate the scientific process of training management.

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