

CASE STUDY: BIOFEEDBACK – A BREATH OF FRESH AIR

Directions: Please read the following case study and answer the questions that follow on a separate sheet of paper.



Period of Study: Late 1970s to early 1980s

Introduction:

Approximately 13 million people in the United States suffer from a chronic respiratory condition characterized by hypersensitivity, inflammation, and obstruction or narrowing of the airways. This condition is commonly known as asthma. An asthmatic person develops swollen airways lined with thick mucus. This causes the surrounding muscles to constrict, making it extremely difficult to breathe and sometimes leading to a life-threatening event. The occurrence of these symptoms is known as an asthmatic episode.

The causes of asthma are generally the results of allergic reactions, stress, endocrine changes, genetic makeup, and/or psychological traits. Those afflicted with asthma suffer from both gasping and irritating interruptions of their daily routine. Asthmatic individuals who choose to participate in aerobic sports of any kind must constantly monitor their breathing patterns. They must always be prepared to manage an oncoming episode.

For the past decade, medication in the form of an oral inhaler was the common way to treat an asthmatic episode. Researchers, however, are currently investigating a possible connection between halting an asthmatic episode and the use of biofeedback.

Hypothesis:

Through the use of biofeedback, or gaining conscious control over an unconscious event, an asthma sufferer can gain control and relieve the tightening of the muscles that constrict airways.

Method:

Recent studies have attempted to find the relationship between changes in muscular tension and breathing patterns in both asthmatic and non-asthmatic individuals. Researchers instructed participants to use deep breathing exercises while hooked up to biofeedback monitors. This allowed the participants to learn to control their heart rates during breathing cycles. The goal of this experiment was to control the muscle reflex that constricts airways during an asthmatic episode. Other types of biofeedback experiments were performed as well. No biofeedback machine was used for these experiments; instead, an important biofeedback "monitor" - a mirror - was used. The participant would perform the same type of breathing exercises in front of the mirror, thus monitoring muscle tension.

Results:

Initial observation showed that the performance of these types of exercises might decrease asthma symptoms. Participants took lower dosages of medication, sometimes eliminating the medication entirely. Emergency room visits by participants involving asthmatic episodes decreased significantly. Overall, the benefits of biofeedback techniques used to control asthma are apparent. A number of questions regarding biofeedback techniques and asthma, however, remain unanswered. One such question involves researching long-term effects of these techniques. Because this research is relatively new, such questions may not be answered for years to come. These studies, though, may be the foundation for future therapies such as biofeedback to control migraine headaches, speech disorders, and blood pressure.

Questions:

1. **What causes asthma?**
2. **Describe how participants monitored their physiological processes in the experiments.**
3. **Critical Thinking: How did participants use biofeedback in the experiments? Why was it successful?**