

# SETTING UP THE NEXT GENERATION BIOFEEDBACK PROGRAM FOR STRESS AND ANXIETY MANAGEMENT FOR COLLEGE STUDENTS: A SIMPLE AND COST-EFFECTIVE APPROACH

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The increasing prevalence of stress and anxiety on college campuses along with limited resources and budget reductions for many campuses has prompted the need for innovative approaches to help students effectively manage their stress and anxiety. With college students becoming more and more technology-savvy, the authors present an innovative biofeedback program that can be easily implemented anywhere with minimal resources in a brief period of time. The program utilizes a portable, user-friendly biofeedback program to help students learn to take control of their stress and anxiety. Better management of stress and anxiety is expected to contribute to both the personal well-being and the academic success of students.

Keywords: biofeedback, stress, anxiety, college students

Stress and anxiety is highly prevalent among college students today. Numerous causes of stress and anxiety include academic pressure, adjustment to college life, financial concerns, family problems, as well as the underlying psychological issues of the individual student. College students have different coping styles and different abilities to manage their stress and anxiety. For many students, stressors during the college years will not interfere with academic performance in a significant way; but those with limited internal or external coping resources are at risk for academic failure and higher dropout rates. Several studies have shown a dramatic increase in the severity of psychological symptoms, including stress and anxiety, among college students seeking help for their mental

health conditions (Kadison & DiGeronimo, 2004; Kitzrow, 2003).

University staff, faculty, and administrators from various campuses have developed a variety of programs and resources to help students with their academic and personal issues: student retention programs, student success programs, wellness programs, health education, counseling, tutoring and mentoring programs, first year experience programs, and other academic support services. The current authors propose that biofeedback programming can also be very helpful to students in the management of stress and anxiety. Although biofeedback is not new to college health and counseling centers, today's new and simpler technology offers a user-friendly and cost

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effective approach that is readily available.

#### **Biofeedback Program**

Biofeedback training programs have been around colleges and universities since the late 1960s with some programs proving to be more successful than others. What is biofeedback training? Biofeedback training is a method of helping individuals learn how to control various physiological processes such as muscle tension, blood pressure, breathing, heart rate, brain wave states, skin temperature, and skin conductance. The non-invasive biofeedback sensors are used to measure the psycho-physiological process of the individual and provide immediate feedback to him or her. Through biofeedback training an individual first gains awareness of the physiological processes occurring within the body and learns to consciously control those processes. Specifically, the individual is trained to modulate the symptoms of stress and anxiety which lead to better functioning for the individual. Ultimately, biofeedback can help individuals with stress, anxiety, college adjustment, depression, hypertension, tension headache, and many other issues (See & Czerlinsky, 1990; Siepmann, Aykac, Unterdorfer, Petrowski, & Mueck-Weymann, 2008; Hammond, 2005; Tsai, Chang, Chang, Lee, & Wang, 2005; Nestorciuc, Rief, & Martin, 2008).

Traditional biofeedback training is provided by a trained or certified biofeedback practitioner who has received didactic education and mentored clinical training in general biofeedback and/or EEG (electroencephalography) biofeedback.

Traditional approaches also involve the equipment with multi-channel input designed to simultaneously measure a variety of psycho-physiological processes such as EEG, EMG (electromyograph), temperature, heart rate, and respiration. Such equipment generally costs between \$1,500 to \$6,000, which can be prohibitive for many campuses.

In recent years, the availability of low-cost, portable, and accurate single modality biofeedback devices has expanded. Many of these devices have been made commercially accessible for individuals and small health centers. Additionally, the technology has progressed to allow individuals to learn how to use the equipment with minimal training. Participants in a recently published study found portable biofeedback device to be more helpful than other relaxation techniques like yoga, meditation, and other unassisted breathing techniques (Reiner, 2008).

#### **Program Set-Up**

As stated previously, biofeedback has been offered on college campuses for many years; some campuses, our own being an example, have offered such services in the past, but found that when the staff with the biofeedback expertise left, the program did not survive.

As we seek to establish a new biofeedback program on our campus to help students with their stress and anxiety, we have developed new criteria to ensure a sustainable, simple, and cost-effective program that is not dependent on one person or a couple of individuals in order to maintain the program.

## Next Generation Biofeedback Program... /

We also wanted to have an unbiased evaluation of newer and less costly biofeedback equipments. To meet this objective, various products were purchased to test with our staff and students. Our selection criteria included: simple and easy to use, portable, inexpensive (less than \$350), widely available to the public, and minimum training time for staff and students. Currently, there are several products that meet our criteria: emWave Personal Stress Reliever ([www.heartmath.com](http://www.heartmath.com)), StressEraser ([www.stresseraser.com](http://www.stresseraser.com)), and Resperate ([www.resperate.com](http://www.resperate.com)). The first two units, emWave PSR and StressEraser, aim to reduce stress level. The third unit, Resperate, is designed to assist in the reduction of blood pressure. All three products help train users to breathe slowly and deeply. Each product has its own feedback response(s) for the user: number, light, graph, bars and/or sound.

We found that the emWave PSR (\$199) best fit our selection criteria and was easiest for our staff and students to use. Another factor influencing our selection of the emWave PSR is the available companion product, the emWave PC, which is a computer-based product with the same technology and ease of use. The emWave PC can be connected to any Windows-based laptop or desktop computer and costs \$299 each. We decided to purchase a couple of the desktop units and several portable units for our counseling center. The combination of the desktop unit and portable unit has worked very well for our students. Students are first introduced to the biofeedback concept and training through the desktop computer. They then can check out

the portable biofeedback unit to continue to practice on their own throughout the week.

Both the computer-based and the portable emWave units use the analysis of heart rate variability or heart rhythms as the biofeedback response. Students can see how their breathing and emotion impact their heart rhythm and use the information on their heart rate variation to gain direct control over their heart rate variability and indirectly over their emotions and the cortical functioning of the brain. Students are also trained that positive emotions are associated with sharper focus, better attention, better decision making, improved problem solving, better memory, reduced blood pressure, reduced muscle tension, and stronger immune system. On the other hand, negative emotions are associated with poor concentration, poor decision making, difficulty solving problems, increased blood pressure, increased muscle tension, greater susceptibility to illness, and decreased health. Through the biofeedback of the emWave unit, students learn to produce heart rhythms that are associated with positive emotions which reduce their stress level and improve their overall well-being.

#### Clinical Implications

One of the keys to the success of the program thus far has been the students' ability to take the portable biofeedback unit home to practice in between the sessions with our staff. The current generation of college students enjoys technology and the portable biofeedback unit fits right in to their tech-savvy nature. With the

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portable unit, we have had close to 100% compliance with the daily practice recommendations. Another important factor is the ease of use of the program for the staff. Anyone can learn to use this next generation biofeedback technology--psychologist, health educator, physician, nurse, and peer educator.

One semester has passed since the initial implementation of the biofeedback program, with promising results thus far. Most students who have utilized the portable biofeedback units reported increased control over their stress and anxiety, with many indicating that changes have been significant. Specific comments from students include: "I feel like I understand my anxiety better"; "I feel a lot calmer"; "the equipment was very easy to use"; "I noticed my ability to use deep breathing in stressful situation". Responses from staff have also been positive as well: "it's much easier to use than the equipment we had in the 80s"; "students responded very well to using technology to help with their problems".

### Conclusion

With increasing stress and anxiety levels among college students along with limited personnel resources to care for our students, utilizing user-friendly biofeedback technology to help students became a very cost-effective intervention. Depending on the size of the student body and the organizational structure of the campus, this next generation biofeedback program can be set up in one or more of the campus units--counseling center, health center, health education unit, wellness center, stu-

dent union, and/or academic advising area. Minimal resources are needed to set up this program in minimal timeframe with the potential for the high return of student success on your campus.

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