

SPECIAL ISSUE

Integration of Mindfulness and Acceptance-Based Biofeedback for Irritable Bowel Syndrome: The Case of Peter

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This paper presents a case study of an application of mindfulness and acceptance-based biofeedback treatment for a male business executive in his 50s with a long-standing history of irritable bowel syndrome (IBS). There is mounting support for the use of mindfulness and acceptance-based skills in conjunction with biofeedback training for management of psychophysiological conditions such as IBS. The more intention and effort we put toward the goal of calming and relaxation, the more likely we are to get in our own way. This is a case example illustrating the notion that it is through awareness and acceptance that we can enact change.

Introduction

Irritable bowel syndrome (IBS) is a chronic functional gastrointestinal (GI) disorder with varying symptoms, which commonly include abdominal pain or discomfort and changes in frequency and consistency of bowel movement. Worldwide estimates suggest that IBS impacts approximately 11% of the population (Canavan, West, & Card, 2014), and symptoms are often associated with reduced quality of life. Stress can trigger worsening IBS symptoms through dysregulation of the autonomic nervous system. Behavioral strategies for management of the stress response can provide IBS sufferers with strategies for strengthening their autonomic reflexes and mitigating the impact of stress on their symptoms.

The Case of Peter

During the intake interview, Peter described himself as a married business executive in his 50s with a 30-year history of GI distress, diagnosed as IBS. Peter described a pattern of increase in the severity of symptoms in the previous 5 to 6 years, which he attributed to increased job stress. Peter also reported a history of anxiety symptoms dating back to childhood. Peter's IBS symptoms had a

significant impact on his quality of life, including his daily commute, ability to travel, and, at times, his relationships. One of the most consistent and significant stressors was Peter's commute to work. He described constant concern about bowel symptoms arising while in the car and being in a situation where getting to bathroom facilities would be challenging and likely delayed. This reinforced negative interpretations of bodily sensations, which exacerbated worry and stress.

Peter was actively engaged in his medical care and also attended biweekly sessions with a primary therapist, addressing other concerns. He was referred to me by his therapist for adjunctive biofeedback to aid in the management of IBS. At the start of our work together, Peter reported that he had tried to integrate breathing and relaxation exercises into his self-care routine in the past with limited success in terms of impact on symptoms.

Baseline Stress and Relaxation Profiles

Biofeedback sessions were conducted using the BioGraph Infiniti™ (Thought Technology, Montreal West, QC, Canada) system. The initial biofeedback assessment phase included conducting psychophysiological stress and relaxation profiles, which are outlined in *The Clinical Handbook of Biofeedback: A Step-by-Step Guide for Training and Practice with Mindfulness* (Khazan, 2013). Findings from these assessments revealed the following areas for treatment focus:

1. Surface electromyography (SEMG): muscle tension increasing in response to stressors (14.1 to 20.3 μ V), with poor recovery.
2. Skin conductance: 17.3 microsiemens at baseline, increasing to 18–19 microsiemens with stressors, with no recovery.

3. Finger temperature: holding at 70°–71°F throughout the assessment.
4. Heart rate variability (HRV): with HR Max – HR Min¹ of 6.9 at baseline.
5. The relaxation profile indicated consistent subthreshold SEMG readings from baseline, reduced skin conductance from 14.4 microsiemens at baseline to 2.4 microsiemens over the course of the exercises, with consistently low finger temperature (71°–72°F), and elevated breathing rate (13.2–17.1 breaths per minute) throughout.

Heart Rate Variability, SEMG, and Temperature Biofeedback

The initial three sessions focused on the development of diaphragmatic breathing skills. Although Peter had practiced these skills in the past, his breathing pattern and report of the experience of breathing indicated a tendency to breathe into his chest as well as overbreathing. He reported past experiences taking in large amounts of air with the goal of “deep” breathing. Several sessions were spent focusing on instruction in diaphragmatic breathing and decreased breathing pace while not taking in larger breaths to compensate for the slowed rate, which Peter practiced regularly between sessions. He quickly began to bring more awareness to his breathing patterns and muscle tension throughout the day and noted that breath holding and muscle “bracing” in particular appeared to relate to abdominal pain intensity.

When paced diaphragmatic breathing became more comfortable, Peter participated in a resonance frequency (RF) assessment. The resonance frequency is the breathing rate at which the highest heart rate variability is produced. Based on the criteria of best respiratory sinus arrhythmia (RSA; i.e., the synchronicity between breathing and heart rate), peak low frequency power, and HR Max – HR Min, Peter’s RF breathing rate was determined to be six breaths per minute. Peter developed a regular practice of RF breathing between sessions. Home practice goals were set in session, gradually increasing the time spent practicing. Peter successfully set aside time at home in the evenings and on weekends to practice paced breathing with the support of a mobile phone pacer application. He also used a finger temperature monitor at home for additional feedback on physiological relaxation between sessions.

¹ The HR Max – HR Min is the mean difference, for a specified time period, between the highest heart rate and the lowest heart rate in each breath cycle.

Mindfulness and Acceptance-Based Skills

Early on in treatment, Peter communicated significant effort applied toward “trying” to “make himself” relax and toward warming his fingers. Frustration would inevitably follow when he could not achieve these desired results. We chose to utilize mindfulness and acceptance-based skills in order to allow Peter to let go of effort in areas where effort appeared to be an unintended but powerful barrier to change. Mindfulness meditation practices were integrated into the instructions and development of biofeedback skills. Peter and I discussed the rationale and background for the integration of these skills. Peter wondered in session whether his desire to “fight” and “brace himself” against his symptoms might be inadvertently exacerbating them.

The majority of sessions included some type of experiential practice of guided mindfulness and acceptance-based skills. These included “Mindfulness of the Breath,” “Body Awareness,” “Thoughts on Leaves,” and “Mindfulness of Thoughts, Feelings and Physiological Sensations” (scripts from Khazan, 2013²), among others. Audio recordings of the exercises were provided for practice between sessions.

As we first discussed integrating mindfulness skills into our work, Peter expressed concern about bringing his awareness to his physical experience and noted that distracting himself from his physical symptoms had been a consistent coping strategy. We discussed how avoidance of these experiences could reinforce negative interpretations of physical sensations and subsequently increase activation of the sympathetic nervous system. Peter expressed willingness to consider an alternative approach.

Peter engaged in the practice of mindfulness and acceptance-based strategies in session and became increasingly aware of interfering thoughts and judgments about sensations in his body. He was able to identify these judgments and the emotional experiences connected to those judgments, including feelings of frustration, anger, and fear. He noted particular challenges with bringing compassion to his experience. While engaging in mindfulness practice, with a particular focus on the practice of compassionate self-talk, Peter experienced greater success in increasing his finger temperature, achieving readings in the low 90°F range in and outside of session, and exhibiting baseline readings in the 80°F range, as well as lowering skin conductance below threshold. During less frequently occurring sessions in which finger temperature did not markedly change, Peter could identify interfering

² For copies of written or audio recorded scripts, please contact Inna Khazan, PhD, at inna.khazan@gmail.com.

thoughts. Early on in treatment, his SEMG readings became consistently low, which Peter attributed to increased muscle tension awareness practice between sessions. While Peter successfully built regular RF breathing into his week, challenges remained for integrating mindfulness-based strategies into his daily routine, particularly during times of higher stress. We focused on problem-solving in session and Peter was able to identify realistic strategies to increase self-awareness and apply strategies throughout the day, especially during the work week. Examples include increased attention to thoughts and breathing while driving to work and on his walk from his car to his office, and mindful breathing and muscle tension awareness check-ins during the workday. Peter also found a bench conveniently located on the route he walks from his parked car to his office and began to build in several minutes of sitting on this bench and engaging in mindful RF breathing practice prior to starting his work day.

After the first few weeks of treatment, we decided that daily monitoring of IBS symptoms could provide data helpful in monitoring of treatment progress. Peter began recording daily ratings of the severity of his symptoms on the scale from 0 to 10, with 0 being no symptoms and 10 being the most severe symptoms imaginable. Weekly means were calculated and charted over the course of treatment (see the Figure), showing a downward trend of severity of symptoms over the course of treatment. Although Peter indicated a belief that learning biofeedback and mindfulness skills positively influenced his symptoms, he also continued to actively seek medical attention, and to attend sessions with his primary therapist. It is likely that mindfulness-based biofeedback together with other treatment modalities contributed to these improvements.

Treatment was suspended when Peter developed increased comfort with the use of biofeedback skills and found ways to practice mindfulness throughout the day. Although at times he struggled with consistent practice of these skills, he was pleased with his progress and the increased sense that he now had tools within his grasp to mitigate the impact of stress on IBS symptoms. He reported that he

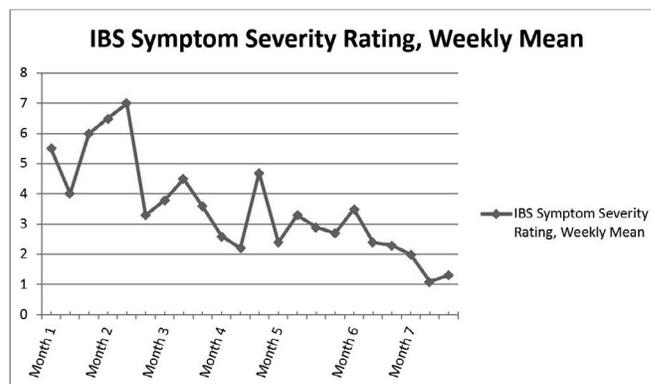


Figure. Self-reported IBS symptom severity ratings. Means based on daily report.

continues to practice self-compassion and awareness of self-judgment.

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