

Cognitive-Behavioral Therapy for an Adolescent Female Presenting With Misophonia: A Case Example

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Abstract

The case illustrates the effective assessment and treatment of misophonia in a 14-year-old adolescent female in which short-term cognitive-behavioral therapy (CBT) and exposure and response prevention (ERP) principles were utilized. Misophonia-related symptomology declined significantly during treatment, and partial gains were consolidated over time with the use of ongoing sporadic booster sessions to maintain reported improvements and to address the variable nature of the patient's symptom expression. Significant tolerance of noise triggers occurred, both within and in between sessions, and the patient achieved concurrent behavioral changes and tolerated a marked reduction in relevant avoidance behaviors. Self-reported and observed psychological and physiological distress diminished when confronted with identified trigger noises, both during conducted in vivo exposures and, more broadly, in the patient's home and school environments. The case serves as a contribution to the growing body of psychiatric literature recognizing misophonia as a distinct phenomenon, and offers anecdotal evidence regarding assessment treatment implications.

Keywords

misophonia, age group: adolescent, cognitive-behavioral therapy (CBT), exposure and response prevention (ERP)

I Theoretical and Research Basis for Treatment

The phenomenon currently known as misophonia has gained more attention in recent years within clinical and research fields as well as greater exposure and reference in popular culture. Translated literally as “hatred of sound,” misophonia (previously referred to as “selective sound sensitivity”) is characterized by extreme sound sensitivity to selective auditory stimuli that often elicits avoidance, rage, and anger outbursts (McGuire, Wu, & Storch, 2015). The physiological and psychological sensitivity is not generalized to all auditory stimuli, but is rather reactive to highly specific trigger sounds that elicit strong affective reactions directed toward the source of the noise. These sounds characteristically generate acute emotional distress manifested in anger

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or disgust to commonly occurring innocuous auditory or visual stimulus referred to as “triggers” (Dozier, 2015). Studies show that general physiological responses associated with this emotional arousal include the sensation of pressure in the head and whole body, clenched/tightening muscles, sweaty palms, difficulty breathing, and increased blood pressure and heart rate (Edelstein, Brang, Rouw, & Ramachandran, 2013). Feelings of disgust typically escalate quickly to anger, rage or harm ideation, and related intrusive thoughts.

Symptoms of misophonia range from mild to acute severity, and can cause profound impairment and debilitation. In addition to causing pervasive avoidance, sufferers of misophonia frequently find themselves enraged at sources of trigger sounds, which can contribute to interpersonal and familial relational stressors. Misophonia has been associated with impairments in academic, professional, and interpersonal functioning (Edelstein et al., 2013). Anticipation of environments or social situations that may elicit a response often has significant behavioral implications. The aversive reactions misophonia sufferers experience are often so potent that they dominate their lifestyle and occupational choices (Bernstein, Angell, & Dehle, 2013). For example, a research study examining 42 participants deemed to have misophonia found that all the participants actively avoided misophonic stimuli by avoiding social situations, wearing headsets, or producing antisounds that resulted in marginal social contacts (Schroder, Vulink, & Denys, 2013). Furthermore, patients experienced daily distress or discomfort by anticipating an unexpected encounter with misophonic stimuli (Schroder et al., 2013). Some patients in the study reported a preoccupation with a specific aversive human sound that triggered impulsive aggression, often characterized by the impulse to scream at or attack the source of the sound to make it stop (Schroder et al., 2013). This anger initiates a profound sense of loss of self-control with the potential for aggressive outburst. Misophonic patients often attribute an intentionality or provocativeness stemming from the source of the sounds, further compounding anger reactions.

It has been noted that the typical onset of misophonia is in childhood, but the condition can occur at any age or resurface intermittently throughout a lifetime. Others view misophonia as a more chronic condition requiring consistent, ongoing symptom management. Some anecdotal evidence suggests that the intensity of symptoms varies in relation to overall emotional distress levels. For example, research has found that severity of misophonia seems to moderately correlate to measurements of anxiety and depression symptoms in a sample population, with possible linkage to sound sensitivity and threshold for tolerating innocuous stimuli (Wu, Lewin, Murphy, & Storch, 2014). Misophonic patients, for the most part, recognize that their reactions are exaggerated, disproportionate, and maladaptive in nature.

Recent research findings and anecdotal reports appear to suggest that trigger sounds often have some striking common qualities and characteristics. It is of particular interest, for instance, that trigger sounds are almost always human generated, rather than machine or animal made (Schroder et al., 2013). Furthermore, it appears that there are certain common sound characteristics that rate high in sufferers of misophonia. Recent research conducted on assessment of misophonia found that 81% of trigger noises were associated with oral- or eating-related functions, such as another person's lip smacking, eating, heavy breathing, crunching, or chewing (Schroder et al., 2013).

Relatedly, with sudden onset occurring in late childhood or early adolescence, initial symptoms often involve noticing a particular feature of a loved one's eating or breathing habits. The afflicted individual becomes obsessed by and hypersensitive to these sounds (Bernstein et al., 2013). Although sounds can eventually become more generalized to a broader population, it has been observed that sufferers tend to be triggered by those to whom they are closest. For example, one family member's chewing may elicit a strong response, whereas another's will go virtually unnoticed. Such observations, if replicated, could present future discussion of possible dynamic or relational aspects of misophonia.

In misophonia, trigger sounds bear little relevance to auditory stimulation as a whole. Accordingly, whenever possible, physician assessment should be incorporated to rule out any other medically based auditory issues, and a thorough assessment conducted to differentiate other possible sound-based disorders. In addition, auditory-related symptomology can share common characteristics with other sensory-aversive reactions such as with tactile experiences and related pronounced disgust and difficulty touching certain textures, such as wool, cotton, or velvet (Schroder et al., 2013).

Despite prevalence estimates ranging from 3.2% of the general population (Jastreboff & Jastreboff, 2014) to 20% in a study of undergraduate students who self-reported clinically significant misophonic findings (Wu et al., 2014), there remains a dearth of psychiatric literature to understand and treat this condition. Although not yet considered an official psychiatric disorder or criteria in *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association, 2013), it has been proposed that misophonia is most appropriately categorized under “Obsessive Compulsive and Related Disorders” with specific proposed diagnostic criteria (Lewin, Storch, & Murphy, 2015).

Misophonia is currently conceptualized as a distinct cluster of symptoms that appear to comorbid with other psychiatric conditions. Sound sensitivity can be common with obsessive-compulsive disorder (OCD), anxiety disorders, and Tourette syndrome (Lewin et al., 2015). Although it does not fit OCD criteria, misophonia shares an overlap with OCD with patients frequently showing aspects of OCD (Schroder et al., 2013). There is preliminary support that this condition may be related to OCD and Tourette syndrome, as they are highly comorbid (McGuire et al., 2015). In one series of 12 cases of tic disorders, the presence of aversive sounds resulted in negative emotional responses, with anger outburst, tics, avoidance, and self-injurious behavior, suggesting that sounds may be a factor in emotional dysregulation in individuals with tic disorders (Robinson, Hedderly, Conte, Malik, & Cardona, 2018).

Ongoing psychological, auditory, and neurobiological inquiry is needed to better understand the condition and treatment implications. Burgeoning literature in these fields is continuing to address the lack of clarity surrounding misophonia and the limited research regarding evidence-based treatments to best manage the condition. Recent case studies and research are focusing on the effectiveness of cognitive-behavioral therapy (CBT) in addressing misophonia. In a recent research study, CBT was effective in treating approximately half the patients receiving this treatment (Schroder, Vulink, van Loon, & Denys, 2017), as they saw a significant decrease in their misophonia symptoms. A greater familiarity with the unique symptom profile and incidence of misophonia can further lead to proper assessment and treatment.

2 Case Introduction

“Cindy,” a 14-year-old female residing at home with her biological parents and older brother aged 18 years, was brought to treatment by her parents for anxiety-related symptoms. Cindy was described as a bright, caring, and high-achieving adolescent. Cindy’s family referred her for treatment based on reported observations that Cindy was appearing more irritable and anxious and less engaged socially in the household and with her peers. Mood variation had also become more pronounced, as Cindy has begun exhibiting uncharacteristic crying episodes and intermittent periods of irritable and depressed mood. Cindy had been experiencing more pronounced difficulty tolerating normative sounds associated with family dinners and during her school day. Cindy expressed motivation for treatment, citing difficulty tolerating acute distress caused by misophonic and related symptoms and increasingly concerned about the potential of increased academic and social impairments. School-based supports had also confirmed that Cindy appeared more anxious, irritable, and less engaged at times.

3 Presenting Complaints

At age 13, Cindy began to exhibit misophonic symptoms related to difficulty tolerating sounds associated primarily with family members' eating behaviors with symptoms becoming gradually more pronounced. Specifically problematic for her were the sounds of knives cutting on plates, though other sounds related to eating also elevated her psychological distress, including others' chewing and heavy breathing. She had particular difficulty listening to the sounds associated with her mother's chewing of food, though sound sensitivity to dishes and utensils was more generalized. Sounds associated with family members eating generated the most acute reactivity, though some of the sound sensitivity and response were generalized to others outside the home. During periods of heightened academic stress and examinations, Cindy experienced similar psychological and physiological responses—for example, the sound of chairs scraping against the floor in school, crinkling paper, and tactile-related sensory sensitivity distress associated with touching certain fabrics.

Cindy often found herself enraged and deeply distressed by the anticipation of sounds in her home and academic environment, accompanied by obsessive preoccupation and rumination with noises previously exposed to, playing them over repeatedly in her head. This caused significant distraction during school and anticipatory anxiety associated with predictions of potential future exposures. During heightened periods of distress, Cindy would sometimes clench her fists or dig her fingernails into her arm in an effort to tolerate the distress. Transient hair pulling of eyelashes coincided with misophonic concerns and distress.

Cindy had begun engaging in increased avoidance behaviors, such as refusing to join the family at mealtimes and requesting that the family use paper plates and plastic knives. She had experienced increased difficulty focusing in school, and isolated herself more in an effort to avoid trigger noises. She would retreat from class and find herself crying alone in the school bathroom. Cindy had frequent intrusive thoughts associated with past sounds or potential future reoccurrences.

Cindy also experienced anxiety related to academic achievement, despite earning scores that maintained her extremely high academic standing. She expressed distress and indecision in social situations, with overconcern for others' needs and emotions. She had a stated tendency to focus on her family's emotional needs, which she prioritized over her own. She described a need to please others and had difficulty coping with family and interpersonal relational stressors, with difficulty asserting her needs and opinions.

4 History

Cindy and her parents described her as a high achiever with a history of perfectionist tendencies. She was described as a compliant, independent, and bright child. Anxiety symptoms became evident at age 11 when Cindy began expressing worry about academic success accompanied by vomiting prior to school examinations. Physician assessment and gastroenterological testing conducted during this period ruled out medical explanations. Cindy also exhibited signs of scrupulosity at a young age, with excessive concern for following rules and not hurting her friends' feelings. During the course of treatment, she remained very focused on grades and academic rankings and, at times, exhibited test anxiety.

Based on family reports, Cindy's family psychiatric history was significant for depression and OCD. Her older brother had been diagnosed and treated for OCD. Her biological father had a history of anxiety and depression. Maternal grandparents were also diagnosed with anxiety and depression.

5 Assessment

At the time of evaluation, Cindy was seen by a clinical psychologist. Written consent was obtained prior to the clinical interview. A semistructured format was used for the clinical interview with the patient and her family. Although no rating scales were utilized, based on information provided, one can surmise and extrapolate that Cindy would measure significantly on most currently used misophonia measuring systems/scales, based on her and her family's report and specificity of symptoms as described above. At the time of evaluation, Cindy did not meet the full criteria for OCD or obsessive-compulsive personality disorder (OCPD), though overlapping features may have been present, and because misophonia is not yet accepted as a distinct diagnostic category, Cindy was given the diagnosis of anxiety disorder not otherwise specified. As evaluation and diagnosis predated the most recent *DSM-5* revision, it is possible that Cindy would have met the criteria for unspecified obsessive-compulsive and related disorders. Cindy was evaluated for the commonly comorbid conditions, such as OCD, tic disorders, and post-traumatic stress disorder (PTSD) but her history was unremarkable for these conditions.

6 Case Conceptualization

Cindy presented with symptoms consistent with the discreet characteristic of misophonia as described in psychiatric research and literature. The auditory nature of her preoccupation and distress responses, and characteristic focus on specific sounds and localized source of trigger noises, support this case conceptualization. Misophonia was reported by the patient and her family as the primary complaint and the main source of psychological distress and impairment, and, therefore, was the primary focus of diagnostic inquiry and treatment formulation.

Cindy's distress was elicited most prominently by identified specified trigger sounds and related associations, which elicited feelings of disgust, anger, and anticipatory anxiety associated with intrusive images. Also present was a subsequent obsessional preoccupation with unwanted sound exposures and increasingly prevalent avoidance behaviors. Superficial self-harm and minor trichotillomania-related behaviors were conceptualized as maladaptive efforts to cope with the onset of misophonic stressors and related psychological underpinnings.

Symptom intensity for Cindy seemed to correlate with other interrelated factors, such as her emphasis on perfectionism, associated periods of heightened academic stress, a self-described tendency toward internalization of negative feelings and emotions in the context of interpersonal and familial conflicts, and related difficulties in assertiveness and emotional communication. These considerations factored significantly into a broader and more comprehensive case conceptualization and formed the basis for a secondary clinical focus and planned interventions to help address target symptoms.

Given Cindy's presenting symptoms, the decision was made to conduct CBT including exposure and response prevention (ERP), in addition to conjunctive assertiveness training as optimal treatment options. Initial treatment planning centered primarily on conducting graduated exposure to strong affective material, both auditory and tactile, and concurrent cognitive restructuring focusing on associations and beliefs connected to exposure to trigger stimuli. The focus of CBT broadened throughout the treatment period to include an interest in other potentially relevant factors described previously. Collateral supportive work with family members was also conceived as beneficial for psychoeducational purposes, and to further support intervention conducted in therapy.

7 Course of Treatment and Assessment Progress

Cindy participated in two treatment periods of weekly and biweekly (every other week) individual therapy sessions with a licensed psychologist, in addition to periodic collateral meetings

with parents to review treatment progress and maximize family supports. Therapy sessions typically lasted 45 min in duration, and were conducted in an office setting on a weekly basis followed by intermittent booster sessions to help maintain achieved gains. Accordingly, the bulk of treatment sessions occurred within a 1-year period, with subsequent therapy sessions interspersed over a 3-year period. Cindy achieved and maintained the bulk of her gains when actively engaged in consistently attended therapy sessions, with partial resurgence of symptoms manifesting during periods of lapse of treatment. Booster sessions were scheduled as needed to address symptom resurgence, which occurred during periods of academic and family stress.

The initial treatment period consisted of clinical engagement and review of psychoeducation regarding misophonia and rationale for treatment, specifically tenets of ERP and related principles. This was conducted both with the patient and her mother, as family support and intervention were deemed important components of treatment. During this initial phase of treatment comprising the first three sessions, the therapist worked with Cindy to develop a thorough and detailed Subjective Units of Distress Scale (SUDS) hierarchy of misophonia and tactile sensory-related triggers, ranging in intensity from moderate to intense levels of associated distress.

This established hierarchy highlighted that the most distressing auditory stimuli were associated with eating-related sounds, such as her mother chewing food or her knife used to cut meat on plates. Lower down on the SUDS hierarchy were sound associations such as a friend grinding her teeth, the scraping noise associated with moving a metal chair against the floor, and paper being crinkled. Imaginary exposures were not initially conducted as a component of treatment, but could have been conceived as a conjunctive element of ERP treatment.

Following the initial treatment period, and in accordance with Cindy's willingness to confront distressing stimuli, the therapist, in collaboration with the patient, began gradually introducing in vivo misophonic exposures, starting with triggers ranking lower on the hierarchy. Exposures began with watching video clips of affectively charged material, with varying degrees of volume and duration of viewing periods. At this juncture of treatment, the therapist noted that SUDS levels recorded intrasession diminished significantly, often to minimal distress levels within a period of less than 10 min. Cognitive processing was conducted pre- and postexposures to help identify irrational thoughts and beliefs associated with ability to tolerate auditory or tactile phenomenon.

Cindy was willing to work with the therapist to gradually increase the level of exposures and related distress levels, and to eventually agree to more authentic in vivo exposures involving actual sounds and source materials causing the misophonic responses. She and the therapist worked together to transition from viewing video clips to conducting actual in vivo exposures during sessions, through utilizing items such as food processing blenders and eating utensils that ranked higher on her SUDS hierarchy. Again, associated distress levels declined significantly as a function of repetition and duration of exposures, though higher intensity exposures did not decline as rapidly or significantly as exposures ranking lower on the hierarchy. Cindy was also in agreement to conduct interim exposures in her home environment as assigned homework, in an effort to reinforce gains achieved during sessions. At this juncture of treatment, the therapist also met regularly with the mother to develop parenting strategies aimed at supporting treatment interventions, including encouraging completion of homework assignments and to coordinate with the larger family system to negotiate incrementally decreasing the various accommodating functions in the household that may have been reinforcing avoidance behaviors.

During the ERP treatment period, Cindy began to report a reduction in the frequency of intrusive thoughts related to unplanned misophonic exposures, experienced greater tolerance of noise triggers, and started becoming less avoidant of predicted interpersonal and environmental triggering events. Exposures conducted during sessions typically yielded a significant reduction of self-reporting of SUDS ratings and significant habituation to aversive stimuli within 10 to 15 min

of continued or repeated exposure. Items inducing the highest levels of predicted distress sometimes required up to 25 min of continuous or intermittent exposure before habituation occurred; however, identical exposures conducted over multiple sessions yielded measurably similar levels of eventual habituation with shorter durations. Anxiety and distress persisted throughout treatment in the presence of identified triggers. Samples of planned and conducted exposures with associated hierarchy of self-reported SUDS levels include the following: cutting food on a plate with steak knife (90), scraping a spoon or fork across a plate (80), viewing video footage of a knife cutting food (70), using knife to cut soft food on a paper plate (60), watching a video of knives cutting (60), watching video of scissor cutting paper (40), and viewing photograph of kitchen knife (30).

Ongoing misophonia-related concerns began causing considerably less interference in daily functioning and a reduction in social and academic impairment. Cindy also reported that fostering her ability to tolerate exposures yielded immediate mood gains and improved self-esteem and confidence. It was also noted that Cindy's stated fears related to predictions of panic attack onset, loss of control, and the prospect of intense crying episodes during exposures did not manifest.

As treatment progressed, a broader focus of CBT treatment coupled with more targeted behavioral exposures were deemed mutually supportive and indicated in addressing her misophonia. Habit-reversal strategies were concurrently utilized in conjunction with ERP to address her eyelash pulling. Cognitive therapy addressed broader generalized anxiety, such as academic stressors, socialization considerations, and perfectionist tendencies, all of which appeared correlated with periods of lower thresholds in her ability to tolerate misophonic triggers. Cindy's willingness and motivation to do ERP was variable during periods of increased academic or relational stressors, though ongoing exposures were incorporated and emphasized consistently as the primary component of ongoing treatment, and Cindy remained mostly compliant with recommended treatment protocols.

The concurrent focus of CBT treatment was centered on addressing relational issues with family and peers. Assertiveness training techniques and the development of adaptive communication strategies helped Cindy to acknowledge and express conflict with her mother, for example, which she attributed to resulting mood gains and reduction in overall anxiety. CBT helped her develop enhanced insight related to underlying emotional states and relevant triggers, and assertiveness skills generalized to relationships with peers and others beyond the family system. CBT also focused on related issues of perfectionism and described need to please others with the goal of fostering a more flexible self-perception. Progressive muscle relaxation strategies were also taught to manage her academic and social stress and were beneficial in reducing hair pulling behavior.

Improvements resulting from these interventions were coupled with an enhanced willingness to continue to conduct misophonia-related exposures, with an eventual overall reduction in misophonia-related distress. Cindy began to report more frequent discussion and resolution of interpersonal dynamics, which may be of clinical relevance, in that, Cindy reported that her mother's chewing caused higher misophonic distress levels during periods of more pronounced mother-daughter relational issues. For example, she reported an increased irritability related to noise tolerance threshold, specifically related to sounds associated with mother's chewing and other eating-related sounds, during a juncture in treatment when Cindy was processing with her therapist thoughts and feelings about her perception that her mother was not as nurturing as desired. Subsequent treatment interventions resulting in increased positive mother-daughter interactions coincided with concomitant reduction in misophonia distress levels.

Cindy and her family report a significant reduction of not only generalized anxiety but also specific misophonia-related distress. Cindy has resumed her ability to eat dinner with her family and is less avoidant overall. Distress levels associated with identified trigger noises, although lower, remain intermittently present. However, she reports an increased tolerance of the specified auditory and tactile stimuli, and consistently reports an overall improved mood. The frequency of crying episodes and anger outbursts has diminished considerably, as well as the frequency and intensity of intrusive thoughts. Treatment is currently ongoing but much less frequent, as Cindy attends sessions only periodically to maintain the gains achieved.

8 Complicating Factors

One complicating factor regarding evaluation and treatment is the lack of official diagnostic criteria as a distinct psychiatric disorder, and also the absence of sufficient evidence-based research to help guide treatment. The choice to use CBT and ERP to treat Cindy fortunately proved effective in this case, and was based partly on evidence of effective treatment of established psychiatric conditions with symptom profile overlap and shared features. In addition, the current lack of consensus on diagnostic clarity and uniformly accepted rating scales further complicates the assessment process and necessary treatment planning.

Because little is known about the etiology of misophonia and related neurobiological or psychological correlates, treatment intervention for this case was, perhaps, appropriately more broadly defined, in that, therapy was not focused solely on CBT and ERP to address misophonia-specific auditory-related symptoms but was also concerned with potentially interrelated factors that were conceptualized as possibly contributing to this unique experience of auditory-based psychological distress. In this case of misophonia, ERP is viewed as the primary therapeutic technique that yielded observed gains and maintained symptom reduction. To what extent nonauditory-related factors, if any, might exacerbate and underlying misophonia presentation remains unclear, and, therefore, might prove to be a relevant complimentary focus of future case conceptualization and treatment planning. For example, some ancillary treatment in the literature has focused on cognitive restructuring around underlying beliefs related to perceived intentionality by those individuals producing the trigger noises, which can contribute significantly to levels of irritability, disgust, or anger. That said, the initial phase of treatment was focused more intently and specifically on ERP intervention, which yielded initial gains, and ERP is to be viewed as in an integral component of treatment for this case, and the backdrop against which other interventions were structured around.

Another potential complicating factor is the intermittent nature of treatment. Due to a variety of factors, scheduling of sessions was sometimes sporadic due to the patient's academic and extracurricular schedule, rather than occurring on a consistent weekly basis as initially recommended by the clinician. It is, therefore, unknown what possible effect a more consistent and continuous course of therapy would have had on the overall treatment. Furthermore, as treatment is ongoing and termination has not yet occurred, it is difficult to predict to what extent gains achieved will be consolidated in the absence of clinical maintenance and support. It is, however, most notable that, despite the indicated limitations in treatment frequency and consistency, ERP still effected significant overall improvement, resulting in fairly immediate gains during the initial phase of treatment, which have been maintained and extended throughout the treatment period.

9 Follow-Up

At Cindy's 24th session, the therapist had observed a significant reduction in misophonia-related symptoms. This overall improvement was reported by Cindy and confirmed by her parents who

observed that she continued to be less avoidant, irritable, and visibly agitated in relation to relevant sound triggers. Her ability to tolerate in vivo exposures of greater magnitude had progressed and generalized to the broader environment. Anticipatory anxiety associated with predicted triggering events was also partially diminished. Superficial self-harming behaviors were considerably less frequent, and she described a generally improved sense of well-being. Cindy continued to report using adaptive communication strategies within her family and peer relationships and was striving to maintain greater cognitive flexibility with regard to self-image, academic perfectionism, and exercising various components of self-care. Cindy attended booster sessions monthly to maintain and maximize the gains achieved throughout her course of treatment.

10 Treatment Implications of the Case

A deeper understanding of misophonia is still in the incipient phases, and there exists limited research and clinical discussion of how to best structure treatment for patients presenting with this unique symptomatology. Due to the debilitating nature of misophonia-related symptoms, it behooves clinicians and researchers to properly identify and diagnose those presenting with this discreet condition, and to offer a combination of interventions that will ultimately prove effective. In the absence of concerted evidence-based research findings to date, anecdotal case discussions may offer some insight as to which treatment modalities may be indicated when treating misophonia and related concerns.

The results of this case offer some optimism that CBT combined with ERP may prove to be an effective therapeutic option when determining how to deliver treatment to sufferers of misophonia. This case also highlights the potential importance of embracing an integrative and comprehensive focus to best support more targeted auditory-related therapeutic interventions. This ongoing clinical inquiry may prove helpful in determining contributing factors that could exacerbate misophonia symptoms, and deepen our understanding of the psychological significance the symptoms may have for a particular patient. ERP treatment alone, when conducted in the initial phase of treatment with Cindy, failed to yield a consolidation of gains, and was subsequently complimented with a broader CBT focus when treatment was restarted. It remains to be determined to what extent a combined focus will prove effective in resolving or managing misophonia in this case, though the initial results appear to be promising.

11 Recommendations to Clinicians and Students

This case study illustrates the importance of considering ERP as a primary treatment modality for treating misophonia, in conjunction with other evidence-based approaches that are known to be effective in addressing conditions with overlapping symptom characteristics. It is incumbent on clinicians to continuously revisit the emerging literature and research pertaining to best practices in treating misophonia. Until there is greater clarity and consensus around the condition, this case suggests that it may prove effective for clinicians to implement ERP as the first course of intervention aimed at alleviating psychological and physiological distress characteristic of this unique condition.

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References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Bernstein, R. E., Angell, K. L., & Dehle, C. M. (2013). A brief course of cognitive behavioural therapy for the treatment of misophonia: A case example. *The Cognitive Behaviour Therapist*, 6, Article e10. doi:10.1017/S1754470X13000172
- Dozier, T. H. (2015). Treating the initial physical reflex of misophonia with the neural repatterning technique: A counterconditioning procedure. *Psychological Thought*, 8, 189-210. doi:10.5964/psyc.v8i2.138
- Edelstein, M., Brang, D., Rouw, R., & Ramachandran, V. S. (2013). Misophonia: Physiological investigations and case descriptions. *Frontiers in Human Neuroscience*, 7, Article 296. doi:10.3389/fnhum.2013.00296
- Jastreboff, M. M., & Jastreboff, P. J. (2014). Treatments for decreased sound tolerance (hyperacusis and misophonia). *Seminars in Hearing*, 35, 105-120. doi:10.1055/s-0034-1372527
- Lewin, A. B., Storch, E. A., & Murphy, T. K. (2015, Summer). Like nails on a chalkboard: A misophonia overview. *OCD Newsletter*. Retrieved from <https://iocdf.org/expert-opinions/misophonia/>
- McGuire, J. F., Wu, M. S., & Storch, E. A. (2015). Cognitive-behavioral therapy for 2 youths with misophonia. *The Journal of Clinical Psychiatry*, 76, 573-574.
- Robinson, S., Hedderly, T., Conte, G., Malik, O., & Cardona, F. (2018). Misophonia in children with tic disorders: A case series. *Journal of Developmental and Behavioral Pediatrics*. Advance online publication. doi: 10.1097/DBP.0000000000000563
- Schroder, A., Vulink, N., & Denys, D. (2013). Misophonia: Diagnostic criteria for a new psychiatric disorder. *PLoS ONE*, 8, e54706. doi:10.1371/journal.pone.0054706
- Schroder, A., Vulink, N., van Loon, A. J., & Denys, D. (2017). Cognitive behavioral therapy is effective in misophonia: An open trial. *Journal of Affective Disorders*, 217, 289-294. doi:10.1016/j.jad.2017.04.017
- Wu, M. S., Lewin, A. B., Murphy, T. K., & Storch, E. A. (2014). Misophonia: Incidence, phenomenology, and clinical correlates in an undergraduate student sample. *Journal of Clinical Psychology*, 70, 994-1007.

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