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Cognitive-Behavioral Treatment of an 11-Year-Old Male Presenting With Emetophobia: A Case Study

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Abstract

The goal of the current case study was to illustrate an evidence-based assessment and the cognitive-behavioral treatment of an 11-year-old male with emetophobia. A multimodal assessment of the child's anxiety symptoms was conducted, including a semistructured diagnostic interview (Anxiety Disorders Interview Schedule: Child and Parent Versions), parent report (Behavior Assessment System for Children–Second Edition.), and child self-report (Revised Children's Manifest Anxiety Scale and Child Depression Inventory). Emetophobia symptoms were assessed via parent and child report of the Emetophobia Questionnaire. Treatment included graduated exposure, cognitive restructuring, and parent training. Improvement was seen within 22 sessions and maintained at a 6 months follow-up. In addition to a reduction in symptoms of emetophobia, discontinuation of medication, and no longer meeting *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*) criteria for specific phobia, treatment gains also included a reduction in internalizing and somatization symptoms as well as an increase in the patient's adaptive skills. This case study illustrates the use of CBT along with parent training as an efficacious treatment for children with emetophobia. It also demonstrates how to incorporate simple, everyday technology (i.e., Internet) to simulate exposures that are otherwise difficult to duplicate in the therapy session.

Keywords

cognitive-behavioral therapy, emetophobia, anxiety, child, technology, case study

1 Theoretical and Research Basis

Emetophobia is defined as a fear of vomiting and has been cited as one of the least understood anxiety disorders (Boschen, 2007; Marks, 1987). While prevalence rates have been estimated as ranging from 1.7% to 3.1% for men and 6% to 7% for women (Hunter & Anthony, 2009; Phillips, 1985), no prevalence rates are available for children. Clinical presentation of people suffering from emetophobia varies and may include a fear of vomiting or fear of seeing others vomit. However, almost all people with emetophobia tend to avoid stimuli that are associated with

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vomiting, such as eating certain foods, avoiding the word *vomit*, or exercising strenuously (Veale & Lambrou, 2006). Although the etiology of emetophobia remains unclear, a recent study suggested that individuals with emetophobia report higher levels of disgust propensity, experience disgust more quickly, and evaluate the disgust experience more negatively (van Overveld, de Jong, Peters, van Hout, & Bouman, 2008). Comorbidity with other anxiety disorders (i.e., obsessive-compulsive disorder [OCD], panic disorder, social phobia, anorexia nervosa) is also quite common (Lipsitz, Fyer, Paterniti, & Klein, 2001; Veale, 2009). Little research has been conducted on emetophobia (Hunter & Antony, 2009). The extant research literature does suggest that emetophobia has an early onset, has a chronic course, and cause significant impairment (Lipsitz et al., 2001). Hence, understanding how to treat emetophobia in children is of significant value.

There is substantial research showing that cognitive-behavioral therapy (CBT) is an effective treatment for children with various anxiety disorders, including separation and general anxiety (Albano & Kendall, 2002; Ishikawa, Okajima, Matsuoka, & Sakano, 2007), panic disorder (Öst, Thulin, & Ramnerö, 2004), posttraumatic stress disorder (PTSD; Foa, Rothbaum, & Furr, 2003), and OCD (Abramowitz, Whiteside, & Deacon, 2005; Foa et al., 2005; Storch et al., 2008). Importance of both behavioral and cognitive factors in the etiology, maintenance, and treatment of phobias has also been documented (Rachman, 1991; Rapee & Heimberg, 1997). Treatment of specific phobia builds on the concepts of learning and social-cognitive theories, which have been applied in various treatment approaches such as systematic desensitization, emotive imagery, flooding, contingency management, modeling, and cognitive-behavioral treatment (Ollendick, Davis, & Muris, 2004). The Coping Cat Program, for example, is among the most widely studied CBT treatments for children earning the distinction of an empirically supported treatment as it has been shown to be effective in treating various anxiety disorders, including social phobia, specific phobias, and school refusal (Albano & Kendall, 2002; Kendall, 1990). The Coping Cat Program, which was one of the first protocol-driven CBT treatments for children, consists of 14 to 18, 60-min sessions over a 12 to 16 week period (Kendall, 1990). The main components of this treatment includes teaching children how to (a) recognize anxious feelings/somatic reactions to anxiety, (b) identify unrealistic or negative thoughts in anxiety provoking situations, (c) cope with the situation by modifying self-talk, (d) participate in imaginal and in vivo exposures to learn how to deal with anxiety feelings, and (e) evaluate performance and self-reinforcement via conducting homework assignments (Albano & Kendall, 2002). While other CBT treatments may vary in their protocol, their core components for the treatment of anxiety include psychoeducation, cognitive restructuring, exposure, modeling, reinforcement, and homework assignments (Ollendick & King, 1998).

As recognized by Kendall and colleagues during development of the Coping Cat, parental involvement is another important component that is integrated in CBT. Parents are encouraged to not only participate in weekly "check-in" to report on treatment progress but also model for their children appropriate behaviors during exposure sessions. Given research that has shown the role of parents' accommodating behavior in the maintenance of various maladaptive behaviors, including anxiety (Storch, Geffken, Merlo, Jacob, et al., 2007), parents are also asked to refrain from engaging in any accommodating behaviors such as providing reassurance (Albano & Kendall, 2002). Parental involvement in CBT has been shown to improve treatment outcomes in anxious children (Barrett, Dadds, & Rapee, 1996).

While significant research has shown efficacy of CBT along with a parental component in the treatment of childhood anxiety disorders, less empirical research has examined whether such a model is effective in treating emetophobia. Several therapeutic approaches have been employed, with mixed results, in the treatment of emetophobia, including hypnotherapy (McKenzie, 1994; Ritow, 1979), imaginal coping (Moran & O'Brien, 2005), systemic behavior therapy (O'Connor, 1983), psychotherapy (Manassis & Kalman, 1990), and combination of treatments (Wijesinghe, 1974). Use of psychotropic medication has also been shown to be helpful in the treatment of emetophobia (Lipsitz

et al., 2001). Theoretical work by Boschen (2007) suggested that individuals with emetophobia have (a) general predisposition to anxiety, (b) somatization vulnerability, (c) catastrophic misappraisal (i.e., tendency to interpret ambiguous stimuli as threatening), (d) hypervigilance, (e) vomit attributions (i.e., cognitions and beliefs about the meaning and unacceptability of vomit), (f) nausea avoidance, and (g) selective confirmation (i.e., failure to obtain disconfirming evidence for vomit expectancies). Based on this model, an optimal treatment for emetophobia would entail the use of CBT with exposure-based interventions along with cognitive restructuring (e.g., helping patients identify problematic automatic and catastrophizing thoughts related to vomiting).

Indeed, Hunter and Antony (2009) described the use of CBT (psychoeducation, graduated exposure, interoceptive exposure, and cognitive restructuring) in the successful treatment of a 40-year-old female presenting with emetophobia. However, case studies related to use of CBT in the treatment of emetophobia in children are very limited with previous studies focusing on adults (Herman, Rozensky, & Mineka, 1993; Kahana & Feeny, 2005; McFadyen & Wyness, 1983; McKenzie, 1994). One of the few case studies with children entailed the treatment of a girl with generalized anxiety disorder who also had a fear of vomiting (Whitton, Luiselli, & Donaldson, 2006). Hence, there remains a need to demonstrate the effectiveness of CBT for a child whose primary diagnosis is emetophobia. In addition, despite research showing the importance of parental involvement in the treatment of childhood anxiety disorders (Albano & Kendall, 2002; Knox, Albano, & Barlow, 1996), no child case studies have shown how to incorporate parents in the treatment of emetophobia. Thus, the current case study sought to illustrate the efficacy of cognitive-behavioral treatment with a parent training component for a child with emetophobia. Last, given the increasing role of virtual technology in the treatment of anxiety disorders (Coelho, Waters, Hine, & Wallis, 2009; Rothbaum et al., 2006), the current case study sought to illustrate how to incorporate simple, everyday technology (i.e., Internet) to simulate exposures that are otherwise difficult to duplicate in the therapy session.

2 Case Presentation

Steve (pseudonym) was an 11-year-old White boy with a history of anxiety symptoms. He lived with both of his biological parents and younger sister (age 8). Both of his parents had completed college and were employed (mother was a pharmacist and father was a business manager). No psychiatric history was reported in the family. Apart from his anxiety symptoms, Steve reportedly got along well with his entire family and had several friends with no significant behavioral or academic difficulties. He was referred by his parents for outpatient treatment to address his anxiety symptoms. Both parental consent and child written assent was obtained prior to the start of treatment. In addition, the child was the one who picked his own pseudonym.

3 Presenting Complaints

Steve's parents reported that he had always had a shy temperament, indicating a general disposition for anxiety. Since that time, both parents indicated that Steve has exhibited significant worry regarding the possible reoccurrence of seeing someone else vomit as well as extreme avoidance. For example, he would avoid engaging in any activities (e.g., playing football) in which a vomiting incident had occurred. He would also attempt to avoid saying or hearing the word *vomit* or any related synonyms (e.g., barf, puke, and throw up). The parents indicated that such avoidance had also generalized to other situations that could remind him of previous incidents (e.g., he avoided attending summer camp where an incident of vomiting could occur during sports activities). Both parents acknowledged accommodating Steve's avoidant behavior (e.g., picking him up from camp after he expressed worry about the possibility of another child vomiting).

In addition to behavioral avoidance, Steve was experiencing other anxiety symptoms. For example, his parents reported that Steve worried on a daily basis about the possibility of another vomiting incident. He was also hypervigilant in terms of monitoring others around him for fear that they may vomit. Significant cognitive errors (i.e., catastrophic misappraisal) were also reported as Steve's parents indicated that he worried someone might vomit if they were coughing or clearing his or her throat. Steve also experience somatic complaints, including gastrointestinal symptoms, sweaty hands, tense muscles, feeling flushed, and rapid heart rate.

Steve's anxiety symptoms were significantly impairing his functioning both at school and at home. His parents reported that at school Steve was having difficulty paying attention in class due to excessive hypervigilance and worry. His symptoms were also affecting his social functioning as he started to avoid sitting with his classmates during lunch time for fear that someone might vomit. He also avoided physical education class and going to field trips or places where large crowds of people might gather; Steve said that the "more people there are, the greater the chances that someone is going to vomit." At home, his parents indicated that his symptoms were affecting his sleep, as he would worry so much about vomiting that he had problems falling asleep. In addition, both of his parents reported that Steve would excessively ask for reassurance about whether someone would vomit or not. It is important to note that Steve himself had excellent insight regarding his symptoms and the significant functional impairment they were causing him.

4 History

Steve's parents indicated that he had been experiencing anxiety symptoms related to the fear of vomiting since approximately 4 years of age. Onset of his anxiety symptoms began after Steve witnessed a child vomit during a social gathering. Steve's mother reported that his related treatment history included being diagnosed with generalized anxiety disorder at age 8 by a psychologist. According to Steve's mother, he also received brief cognitive therapy at that time, which involved trying to teach Steve how to "replace his thoughts about vomit with more neutral thoughts." His mother indicated that she discontinued treatment after a couple of sessions as Steve did not seem to be improving. Steve could not remember much of his prior treatment except that "it did not work." More recently, Steve's pediatrician had prescribed him Zoloft (75 mg), but both of Steve's parents indicated only limited improvement.

5 Assessment

A multimodal assessment of Steve's anxiety symptoms was conducted, which included a clinical interview with Steve's parents. The information presented in the previous sections regarding Steve's presenting problems was obtained through the clinical interview. The Anxiety Disorders Interview Schedule: Child and Parent Versions (ADIS-IV: C/P; Silverman & Albano, 2004) was also administered to determine the presence or absence of any specific anxiety disorders. Based on the ADIS-IV: C/P, it was determined that Steve met criteria of the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text revision [*DSM-IV-TR*]; American Psychiatric Association, 2000) for specific phobia.

Next, his parents filled out the Behavior Assessment System for Children–Second Edition (BASC-2; Reynolds & Kamphaus, 2004). The BASC is a widely used behavior checklist that taps emotional and behavioral domains of children's functioning. The BASC has a well-established internal consistency, reliability, and validity (Doyle, Ostrander, Skare, Crosby, & August, 1997; Reynolds & Kamphaus, 2004). The parent version used for children aged 6 to 18 contains 148 items. Each item on the BASC is rated on a 4-point scale with respect to the frequency of occurrence (never, sometimes, often, and almost always). The measure yields scores on broad

internalizing, externalizing, and behavior symptom domains as well as specific Adaptive/Social Functioning Skills Scales. None of the scales of the BASC-2 were significantly elevated.

Steve, himself, filled out self-report measures. It is important to note that while we did not perform any formal intellectual or academic assessments, Steve was likely of above-average intelligence as he had reportedly always been an honor roll student who enjoyed reading. Therefore, he was able to understand and fill out almost all questions on his own, although the therapist was available to clarify any questions he may have not understood. Steve denied any significant general symptoms of anxiety and/or depression as assessed via the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) and the Child Depression Inventory (CDI; Kovacs, 1992). Both the RCMAS and CDI have been shown to have good internal consistency and test-retest reliability (Varela & Biggs, 2006; Sitarenios & Stein, 2004).

Last, to obtain a baseline level of Steve's anxiety symptoms related to emetophobia, an adapted version of the Emetophobia Questionnaire (EQ; Bouman & van Hout, in preparation) was administered to both Steve and his parents. The EQ is a 115-item scale that contains items on three aspects of emetophobia: (a) worry or emetophobic complaints (e.g., "I am afraid of vomiting"), (b) emetophobic avoidance (e.g., "I avoid being around people who look as if they may be sick"), and (c) emetophobia consequences (e.g., "Because of my fear of vomiting, I have lost weight"). Items are rated on a Likert-type scale from 1 (*not at all*) to 5 (*very much*) with higher scores indicating more severe symptoms. This scale was originally developed and validated for adults within a Dutch population at the University of Groningen and Maastricht University (see van Overveld et al., 2008, for more details). Thus, the current study adapted the EQ for use with a child; some questions were removed due to its adult content (e.g., "I avoid drinking alcohol"). Hence, a total of 110 questions were retained. All four scales of this questionnaire were administered: the total score (110 items, scoring range 110-550), worry/emetophobic complaints (68 items, scoring range 68-340), emetophobic avoidance (26 items, scoring range 26-130), and emetophobia consequences (16 items, scoring range 16-80).

6 Case Conceptualization

Data from the initial assessment suggested that Steve's anxiety symptoms were best attributed to specific phobia rather than general anxiety disorder with no other co-occurring disorders. Both the child and parent report on the EQ also indicated that he was experiencing significant impairment and distress related to vomiting that occurred on a daily basis. Based on Boschen (2007) and Veale's (2009) cognitive-behavioral model for emetophobia, treatment components suggested to Steve's parents included psychoeducation, exposure-based interventions, and cognitive restructuring. In addition, given the role of Steve's parents in accommodating and inadvertently reinforcing his avoidant behaviors as well as worry (e.g., reassuring him that "things will be okay"), parent training was also recommended.

7 Course of Treatment and Assessment of Progress

Psychoeducation. Educating both Steve and his parents about the cognitive-behavioral conceptualization of emetophobia (Boschen, 2007), associated features of the disorder, and treatment options was accomplished during the first therapy session. Neither Steve nor his parents had heard that there was a specific phobia classified as emetophobia as they had previously been told that Steve was "generally anxious." After psychoeducation, both Steve and his parents indicated feeling more confident about the course of treatment. Although the majority of psychoeducation was provided in this first session, the therapist supplemented the educational information throughout treatment, especially when implementing the cognitive restructuring interventions.

Table 1. Hierarchy of Emetophobia-Related Situations

Situations	SUDS
Touching vomit with bare hands	10
Touching vomit with gloves	10
Holding a plastic bag with vomit	10
Seeing live vomit remains in a trash bin	10
Seeing a person vomit (e.g., either in person or on television/movie)	10
Viewing still pictures of people vomiting	10
Seeing or hearing children become sick (e.g., look pale, ill)	9
Going to a place or doing an activity where he has seen a person vomit (e.g., recess)	9
Seeing vomit remains (not actually seeing someone vomit)	8
Running around	7
Seeing other children run in a crowded area	7
Hearing someone vomit	6
Saying the words *vomit*, *throw up*, *barf*, *puke*	6
Hearing himself or someone else cough or burp	5
Going to a place where he saw someone vomit (e.g., lunch room)	4
Going to a basketball practice	3
Hearing a coughing sound	2
Eating a lot and feeling that stomach is full	2

Note: SUDS = Subjective Units of Distress Scale.

Graduated exposure. Using educational aspects of March and Mulle's (1998)'s pediatric OCD exposure and response prevention manual, the second therapy session was focused on explaining the rationale and behavioral principles of exposure-based interventions to Steve and his parents. A fear hierarchy specific to Steve's emetophobia was also created, and Steve was educated about the Subjective Units of Distress Scale (SUDS; Wolpe, 1969) so that he could assign severity ratings (range from 1 to 10) on how difficult he expected it would be for him to engage in such exposures. Steve's fear hierarchy is presented in Table 1. As seen in Table 1, Steve rated several items as a "10." Reordering all of the items with a "10," to ensure an accurate hierarchy, was accomplished by asking Steve to choose the most difficult item for him, followed by the next one, and so forth. From Sessions 3 to 21, Steve engaged in more than 13 exposures and was eventually able to complete all items on his hierarchy. He was also instructed to repeat the same exposures at home between sessions. Several exposures had to be repeated in session due to the difficulty that Steve had in habituating to them. Hence, some exposures were broken into simpler and more accomplishable goals. For example, toward the end of his hierarchy, Steve had difficulty progressing from viewing vomit to touching vomit. Thus, this last step was broken into several exposures (e.g., touching it with gloves on, another exposure with only one hand with a glove, touching vomit with only one finger, etc.).

As discussed by Leahy and Holland (2000), exposures can either be in vivo or imaginal. Although both types of exposures have been found to be helpful in reducing anxiety symptoms (Abramowitz, 1996; Foa et al., 2005; James, Hampton, & Larsen, 1983), in vivo exposures are generally recommended for children who may have more difficulty imagining specific phobic situations (Geffken, Pincus, & Zelikovsky, 1999). Consequently, the therapist made efforts for as many exposures as possible to be in vivo. Recently, there has been clinical work using virtual technology to simulate exposures that are otherwise difficult to duplicate in the therapy session (Coelho et al., 2009; Rothbaum et al., 2006). Hence, taking this into consideration, a unique aspect of this case study was the use of www.youtube.com videos to simulate incidents of other people burping and vomiting (e.g., burping queens video: http://www.youtube.com/watch?v=uWl6KgNKedY). Internet still pictures of vomit were also used as visual aids (e.g., vomit pictures: http://www.youtube.com/watch?v=8w1PqFnC1SU). Finally, simulated vomit recipes available online (http://www.metacafe

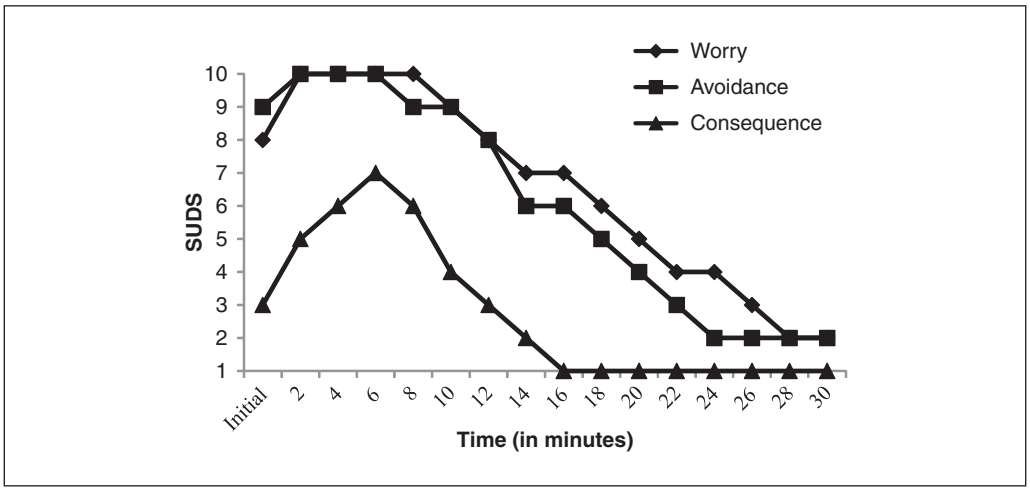

Figure 1. Example exposure: Saying the words *throw up*, *vomit*, *barf*, *puke*

.com/watch/381121/fake_vomit_recipe/) were used in session with Steve, without his knowledge that the vomit was not real. It is important to note that Steve's parents were aware that specimens of vomit used in treatment were simulated and they provided specific consent for such deception as it was deemed critical for treatment.

As seen in Figure 1, exposure was successful in eliciting Steve's anxiety symptoms as many of his initial ratings were reported as close to 10. Behavioral manifestations of his anxiety were congruent with his ratings as Steve displayed various anxiety symptoms (e.g., face was bright red, sweaty hands, and significant crying). Behavioral avoidance was also noted as he would often try to end the therapy session by whining that he did not want to do the exposure anymore or ask for reassurance from the therapist or his parents. It is important to note that Steve never physically attempted to flee treatment although he verbally would say that he wanted to leave. One of the therapist's primary goals during these exposures was to keep Steve focused on the stimuli that were eliciting his anxiety and prevent him from distracting himself; Steve tried various times to divert his attention by either moving his body away from the stimulus or trying to engage in another conversation. Eventually, Steve was able to sense his anxiety decrease with the passage of time. SUDS ratings, based on the three domains assessed by the EQ, were collected every 2 min during each exposure. As seen in Figure 1, Steve's main concerns were regarding emetophobia worry/complaints and emetophobia avoidance, whereas he did not seem very concerned about the consequences of vomiting. It would typically take about 30 min for Steve's ratings to decrease to acceptable levels, for example, SUDS of 3. Both parents and Steve reported that repeating such exposures for homework was critical to his success as the desensitization became faster and faster to the point where his initial levels were not elevated indicating that he was ready to move on to the next exposure in his hierarchy. Such graduated exposure addressed two components of Boschen's (2007) formulation: nausea avoidance and selective confirmation. Thus, preventing Steve from escaping his anxiety/arousal taught him that anxiety/arousal goes down on its own, and also disconfirmed some vomit expectancies; for example, just because I heard someone burp repeatedly does not mean that they will vomit.

Cognitive restructuring. As suggested by Boschen (2007), individuals with emetophobia tend to engage in cognitive errors such as having catastrophic misappraisals of what a stimulus may indicate or inaccurate beliefs about what vomiting may indicate. For Steve, it was apparent that he engaged in automatic thoughts catastrophizing about someone's behavior as an indication that they will

vomit. For example, he would say that if "someone looks sick, they will vomit." When asked how sure he was that they would vomit, Steve would provide a response rate of as high as 90%. The therapist introduced cognitive restructuring to Steve after he started to engage in the exposure-based intervention (Session 4). As with any cognitive restructuring techniques, it was first important to educate Steve about what automatic thoughts were and how they became automatic.

A self-awareness component was subsequently added in which Steve was asked to begin monitoring some of his thoughts. Exercises (e.g., thought bubbles) borrowed from evidence-based child cognitive treatments such as the Coping Cat (Kendall & Hedtke, 2006) were used. Once Steve's thought awareness increased, the therapist helped Steve learn how to modify his automatic thoughts. It is important to note that his experiences with exposures were critical in helping him modify his thoughts by "finding evidence for and against his thoughts." Using the same example of his belief that if "someone looks sick, they will vomit," Steve's 90% confidence of this statement started to decrease as he engaged in exposures and found evidence against this thought. Toward the end of the treatment, Steve reported only a 10% confidence in his statement as his thought became more like "just because someone looks sick does not mean that they will vomit." Other techniques such as doing a visual cost/benefit analysis of avoiding things that remind him of vomit were also implemented throughout the treatment. This cognitive restructuring component specifically addressed three components of Boschen's (2007) formulation: catastrophic misappraisal, vomit attributions, and hypervigilance. By doing these cognitive restructuring exercises, Steve started realizing that his level of worry regarding vomit-related stimuli was excessive, and he began to use self-talk as way to stay in situations that he would have normally escaped as well as to decrease the amount of monitoring or hypervigilance in which he was engaging.

Parent training. Given that the cognitive-behavioral model for emetophobia was based on limited past treatment research with adults (Boschen, 2007), the current case study presents an additional parent training component that will likely be critical for the treatment of children with emetophobia. The role of accommodating behaviors, by any family member, is widely cited as a factor to consider in the maintenance of various anxiety disorders as well as general maladaptive behavior (Storch, Geffken, Merlo, Jacob, et al., 2007). Moreover, Ollendick et al. (2004) emphasized the active role of parents in the treatment of children with specific phobia. In Steve's case, both of his parents indicated engaging in two specific accommodating behaviors that likely contributed to the maintenance of Steve's anxiety symptoms. First, *physical reassurance* entailed their facilitation of Steve's escape or avoidant behavior by physically helping Steve leave the anxiety-provoking situation, for example, picking him up from camp. Second, *mental reassurance* involved their reinforcement of Steve's cognitive symptoms of anxiety by trying to comfort Steve or helping him get distracted from the worry or anxiety-provoking stimuli. It is understandable how parents initiate both forms of reassurance in the efforts to help alleviate the distress of their child.

Hence, one of the most significant aspects of parent training conducted in Steve's treatment was educating the parents about the role of accommodating behaviors in maintenance of his anxiety symptoms and encouraging them to stop such behaviors. The psychoeducational component of this aspect of parent training was implemented during the first session. Following this session, the therapist would meet with Steve's parents at the beginning of each subsequent session for about 10 min. This 10-min period was used to (a) discuss Steve's exposure homework and treatment progress and (b) discuss their progress in refraining from engaging in any accommodating behaviors. The therapist praised the parents' effort to help Steve complete his homework assignments as well as from refraining from any accommodating behaviors. The therapist also helped them process any negative feelings toward implementing the intervention (e.g., feeling guilty or nervous themselves seeing their child in distress and not rescuing him from the situation) by empathizing with them yet reminding them of the role of accommodating behaviors in the cycle of anxiety. Steve's parents were quick to implement this component of treatment as they no longer picked up Steve from extracurricular activities when Steve tried to escape emetophobia

Table 2. Treatment Outcomes

	Baseline		Posttreatment		Follow-up (6 months)	
	Child	Parent	Child	Parent	Child	Parent
Emetophobia[a]						
Worry/emetophobic complaints	113	187	84	90	84	83
Emetophobic avoidance	43	67	30	30	29	29
Emetophobia consequences	31	38	16	17	16	16
Total score	187	292	130	137	129	128
Medication—Zoloft	75 mg		25 mg		None	
Diagnoses						
ADIS-IV:C/P specific phobia	Yes		No		No	
General emotional and adaptive[b]						
Adaptive skills	44		51		51	
Anxiety	58		51		55	
Depression	43		39		42	
Somatization	56		45		41	
Withdrawal	49		42		47	

Note: ADIS-IV: C/P = Anxiety Disorders Interview Schedule: Child and Parent Versions; BASC-2 = Behavior Assessment System for Children–Second Edition.
a. Raw scores in the Emetophobia Questionnaire.
b. *T*-scores in the BASC-2.

symptomatology, for example, when he called them complaining about his stomach, and no longer helped Steve avoid stimuli that reminded Steve of vomiting such as burping in the house.

As described in the treatment model for specific phobia (Ollendick et al., 2004), the parent training component of the current study also used the "transfer of control" concept (Ginsburg, Silverman, & Kurtines, 1995) and family anxiety management model (FAM; Dadds, Heard, & Rapee, 1992) in which the therapist gradually transfers treatment responsibility to the parents. Such transfer of control was accomplished by having the parents actively involved in monitoring of Steve's treatment progress by helping him complete homework assignments between sessions. It is unlikely that preteens would independently remember to do multiple exposure-based homework assignment for the next session. Hence, parents play an important role in reminding their child to do their exposure-based homework as well as in helping their child during exposures. Parents need to learn from the therapist how to keep the child focused during the exposures and not let him or her distract themselves from the anxiety-provoking stimuli. Steve's parents were instructed to not allow an exposure to end prior to his anxiety decreasing as fleeing would only reinforce Steve's anxiety. Steve was a very compliant child with no fleeing episodes ever reported during home exposure sessions.

Parents also help the child by recording the various aspects of the exposures, for example, SUDS, keeping track of time. Last, parents must reinforce the child for doing exposure-based homework. As with any behaviorally based parent training principles, different contingencies may be used ranging from special play time, other positive reinforcements, and if deemed necessary, punishment. Although both of Steve's parents initially attended therapy, Steve's mother assumed the role of primary caregiver in charge of monitoring treatment progress. His mother indicated that participating in his treatment between therapy sessions helped her tremendously in terms of understanding and empathizing with Steve's symptoms as well as giving her confidence that Steve could independently handle the symptoms with the passage of time. This participation in treatment in turn facilitated her in discontinuing accommodating behaviors.

Steve was seen for 22 (50 min) sessions over the course of 6 months. Table 2 shows the treatment outcome on the clinical measures. First, substantial improvement was found across all four

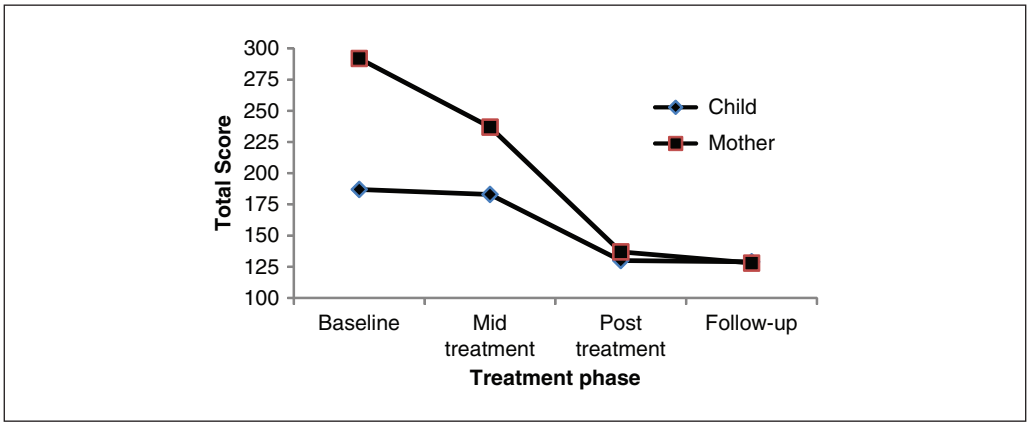

Figure 2. Emetophobia total scores across treatment phases: Parent and child report

scales of the EQ (the total score, worry/emetophobic complaints, emetophobic avoidance, and emetophobia consequences) as reported by both Steve and his parents. As graphically depicted in Figure 2, Steve's overall emetophobia scores reduced by 31% according to his self-report and 53% according to his parents' report, with scores reaching close to the floor of the scale (110 is the minimum score). Second, and perhaps more importantly, by the end of treatment, Steve no longer met *DSM-IV* criteria for specific phobia according to the ADIS-IV: C/P. Not only was treatment successful in reducing emetophobia specific symptoms but it also appeared to slightly decrease Steve's general levels of internalizing and somatization symptoms as well as increase his adaptive skills. His parents also reported a significant reduction in his medication (i.e., Zoloft) dose.

8 Complicating Factors

Comorbid anxiety disorders are among the most common complicating factors when treating emetophobia. Fortunately, Steve's anxiety symptoms seemed to be specifically focused on the fear of seeing someone else vomit. Steve's primary complicating factor, which is not uncommon in children/teenagers, was a low motivation for treatment, especially given his previous unsuccessful treatment attempts. He also indicated a lack of confidence in the efficacy of CBT. Hence, initial sessions were devoted to building his motivation and positive attitude toward the treatment. This complicating factor also resulted in slower treatment progress (i.e., 22 sessions) as the therapist had to repeat several exposures or break down some exposures into smaller versions to encourage Steve. However, given the success and maintenance of his treatment gains at a 6 month follow-up, this highlights the importance of individualizing treatment and being flexible on the number of sessions provided.

9 Managed Care Considerations

There was no significant managed care consideration in this case as Steve's insurance allowed unlimited outpatient visits.

10 Follow-Up

Steve's treatment gains were maintained at a 6-months follow-up. During the follow-up session, Steve's parents reported that he had encountered several situations related to vomit and handled

it extremely well. For example, they indicated that during a family trip to a theme park, Steve witnessed a person choke and subsequently throw up. They indicated that in the past Steve would have been extremely preoccupied and worried regarding the incident. However, this time they indicated that he did not display any physical symptoms of anxiety (e.g., did not look flushed) and was in fact able to joke about it and proceeded to enjoy the rest of his vacation without any significant symptoms. His parents also indicated that Steve's medication (i.e., Zoloft) was discontinued 2 weeks after the termination of the treatment.

11 Treatment Implications of the Case

This case report contributes to the literature on emetophobia by demonstrating the effectiveness of implementing a treatment that contains evidence-based cognitive (e.g., cognitive restructuring) and behavioral components (e.g., graduated exposure) in a child patient. It also shows the importance of implementing a treatment based on a conceptual model for the disorder. A unique aspect of implementing graduated exposure for patients with emetophobia is determining how to provide in vivo exposures. The current case study highlights the importance of technology as a way to expose patients to stimuli that are otherwise difficult to recreate within the therapy session. While recent research has documented the effectiveness of virtual reality-based exposures (Coelho et al., 2009; Rothbaum et al., 2006), the current study suggests that similar experiences may be provided via less expensive means such as the Internet. For example, www.youtube.com was a tremendously helpful website for exposures, as videos of vomiting were easily found; the current case study used various video clips from www.youtube.com as exposures for Steve during session. Another potential advantage of using the Internet, versus virtual reality-based technology, is its transportability as a significant number of families already have access to the Internet at home. Hence, as in Steve's case, patients can do video exposures at home for homework between therapy sessions.

The last unique aspect of this case study is the adaptation of CBT to children with a parent training component. While no significant changes are needed for graduated exposure-based interventions for children, the current study implemented cognitive restructuring techniques that have been adapted elsewhere for children (e.g., Coping Cat) with significant success (Albano & Kendall, 2002). Although those cognitive techniques were originally developed for children with general anxiety symptoms, the current study demonstrates the generalizability of such cognitive strategies to a phobia treatment for children. Addition of a parent training component to CBT is an important aspect of the current case study. While the role of socialization (e.g., parenting behavior) in the etiology of emetophobia is limited, research has highlighted the role of accommodating behavior in the maintenance of various maladaptive behaviors and/or disorders (Storch, Geffken, Merlo, Jacob, et al., 2007). The current case study illustrates how parents can inadvertently reinforce anxiety-related behaviors through what has been described as physical and mental reassurance. Hence, major aspects of parent training involved in the treatment of emetophobia is educating parents about the role of accommodating behaviors in the maintenance of anxiety symptoms and training them to discontinue such behaviors. There is some evidence in the literature on the treatment of OCD in children that parental participation is essential for the success of the interventions (Knox et al., 1996); more experimental controls would be required than provided by the current case report for similar conclusions about the treatment of emetophobia in children.

12 Recommendations to Clinicians and Students

This case study provides clinicians with preliminary evidence that integrating technology in exposures in CBT is a promising treatment for children with emetophobia and that a parent training component to such treatment is helpful. Clearly, results from a single case study have limited

generalizability and controlled studies are needed to determine the efficacy of CBT for children with emetophobia. Other limitations from our case study include longer than expected treatment sessions (i.e., 22 sessions vs. 8-12) as well as the simultaneous use of both behavioral and cognitive interventions. Should treatment start with cognitive restructuring without any exposures, children may have a more difficult time developing ways to address their automatic thoughts. Future research should examine whether the order of implementation of exposures versus cognitive restructuring significantly affects treatment success in children with emetophobia. Despite these limitations, this case study provides important ideas for future research on the treatment of emetophobia and highlights the feasibility of conducting treatment with children as well as how to use everyday technology in implementing exposure-based interventions. Another important recommendation for clinicians and students is to conduct a thorough evaluation prior to the start of treatment, especially given the comorbidity among anxiety disorders. Last, our case study also demonstrates the importance of having a measure to track treatment progress. In the absence of a screening and monitoring tool for emetophobia, we adapted a questionnaire originally intended for adults. Although the reliability of such a measure within a child population remains an important question for future research, our case study does show the feasibility of using a questionnaire as a treatment progress tool as both parent and child report showed significant improvement across time.

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