Cognitive-Behavioral Treatments for Anxiety and Stress-Related Disorders

Joshua E. Curtiss, Ph.D., Daniella S. Levine, B.A., Ilana Ander, B.A., Amanda W. Baker, Ph.D.

Cognitive-behavioral therapy (CBT) is a first-line, empirically supported intervention for anxiety disorders. CBT refers to a family of techniques that are designed to target maladaptive thoughts and behaviors that maintain anxiety over time. Several individual CBT protocols have been developed for individual presentations of anxiety. The article describes common and unique components of CBT interventions for the treatment of patients with anxiety and related disorders (i.e., panic disorder, social anxiety disorder, generalized anxiety disorder, obsessive-compulsive disorder, posttraumatic stress disorder, prolonged grief). Recent strategies for enhancing the efficacy of CBT protocols are highlighted as well.

Focus 2021; 19:184–189; doi: 10.1176/appi.focus.20200045

Anxiety disorders are among the most prevalent of mental disorders and are associated with high societal burden (1). One of the most well-researched and efficacious treatments for anxiety disorders is cognitive-behavioral therapy (CBT). At its core, CBT refers to a family of interventions and techniques that promote more adaptive thinking and behaviors in an effort to ameliorate distressing emotional experiences (2). CBT differs from other therapeutic orientations in that it is highly structured and often manualized. CBT sessions often occur weekly for a limited period (e.g., 12–16 weeks), and a small number of booster sessions are sometimes offered subsequently to reinforce independent use of skills. A cognitive-behavioral conceptualization of anxiety disorders includes identification of dysfunctional thinking patterns, distressing feelings or physiological experiences, and unproductive behaviors. When each of these three components interact and mutually reinforce one another, distressing and impairing levels of anxiety can be maintained over time. Although there are several CBT interventions for different types of anxiety, some common techniques and treatment goals form the basis of the CBT philosophy.

COGNITIVE INTERVENTIONS

One of the primary CBT strategies is cognitive intervention. In brief, CBT holds that one's emotional experience is dictated by one's interpretation of the events and circumstances surrounding that experience (2, 3). Anxiety disorders are associated with negatively biased cognitive distortions (e.g., "I think it's 100% likely I will lose my job, and no one will ever hire me again"). The objective of cognitive interventions is to facilitate more adaptive thinking through cognitive restructuring and behavioral experiments. Cognitive restructuring promotes more adaptive and realistic interpretations of events by identifying the presence of thinking traps. These cognitive traps are patterns of biased thinking that contribute to overly negative appraisals. For example, "black-and-white thinking" describes the interpretation of circumstances as either all good or all bad, without recognition of interpretations between these two extremes, and "overgeneralization" describes the making of sweeping judgments on the basis of limited experiences). Through identification of thinking traps, cognitive restructuring can be used to promote more balanced thinking, encouraging patients to consider alternative interpretations of circumstances that are more helpful and less biased by anxiety (e.g., "Maybe thinking the chance of losing my job is 100% is overestimating the likelihood that it will actually happen. And, it's not a forgone conclusion that even if I lose my job, I will never find another one for the rest of my life."). Similarly, behavioral experiments can be used to facilitate cognitive change. Behavioral experiments involve encouraging patients to empirically test maladaptive beliefs to determine whether there is evidence supporting extreme thinking. For example, if a patient believes that he/she/they is romantically undesirable and that asking someone on a date will cause the other person to react with disgust and disdain, then the patient would be encouraged to test this belief by asking someone on a date. Some combination of cognitive restructuring and behavioral experiments are often implemented in CBT across all anxiety disorders.

BEHAVIORAL INTERVENTIONS

There are several behavioral strategies in CBT for anxiety disorders, yet the central behavioral strategy is exposure therapy. Exposure techniques rely on learning theory to explain how prolonged fear is maintained over time. Specifically, heightened anxiety and fear prompt individuals to avoid experiences, events, and thoughts that they believe will lead to catastrophic outcomes. Continued avoidance of feared stimuli and events contributes to the maintenance of prolonged anxiety. Consistent with the premises underlying extinction learning, exposure exercises are designed to encourage a patient to confront a feared situation without engaging in avoidance or subtle safety behaviors (i.e., doing something to make an anxiety-inducing situation less distressing). After repeated exposures to a feared situation (e.g., heights) without engaging in avoidance or safety behaviors (e.g., closing one's eyes to avoid looking down), the patient will learn that such a situation is less likely to be associated with disastrous outcomes, and new experiences of safety will be reinforced. Similar to the behavioral experiments described in the cognitive intervention section above, which test whether a faulty thought is true or false, exposure exercises offer the opportunity for patients to test their negative beliefs about the likelihood of a bad outcome by exposing themselves to whatever situations they have been avoiding. Thus, cognitive approaches and exposure exercises are complementary techniques that can benefit individuals with anxiety disorders. In the following sections, different aspects of CBT will be explored and emphasized insofar as they relate to specific presentations of anxiety.

CBT FOR SPECIFIC DISORDERS

Panic Disorder

Panic disorder, as defined by the *DSM-5*, is characterized by recurrent, unexpected panic attacks accompanied by worry and behavioral changes in relation to future attacks. Panic attacks are marked by acute, intense discomfort, with symptoms including heart palpitations, sweating, and shortness of breath. Individuals with panic disorder exhibit cognitive and behavioral symptoms, such as catastrophic misinterpretations of their symptoms as dangerous (e.g., "my heart pounding means I will have a heart attack") and avoidance of situations or sensations that induce panic (4). Cognitive-behavioral treatments thus target these symptoms. For example, cognitive restructuring is used to help patients reinterpret their maladaptive thoughts surrounding panic (e.g., "if I get dizzy, I will go crazy") to be more flexible (e.g., "if I get dizzy, it may just mean that I spun around too fast"). Behavioral treatments for panic include exposure to the situations (i.e., in-vivo exposure, which might include driving in traffic or riding the subway) and bodily sensations (i.e., interoceptive exposure, which would include physical exercises to bring on physical symptoms) that trigger panic in order to reduce the fear and anticipatory anxiety that maintain the symptoms. The aim of these exposures is to illustrate that the situations and sensations are benign and not indicative of danger.

Generalized Anxiety Disorder

Generalized anxiety disorder (GAD) is characterized by excessive and uncontrollable worry about several life domains (e.g., finances, health, career, the future in general). Treatment for GAD involves a wholesale approach to target excessive worry with a combination of cognitive and behavioral strategies (5). Although cognitive restructuring exercises are indeed emphasized throughout the treatment to target dysfunctional thoughts, usually further cognitive treatments are included to address worry behavior in addition to thought content. Individuals with GAD rarely achieve complete remission after restructuring only one of their negative thoughts. The CBT conceptualization of worry describes worry as a mental behavior or process, characterized by repetitive negative thinking about catastrophic future outcomes. To target worrying as a process, cognitive techniques, such as mindfulness, are emphasized. Rather than targeting the content of worry (e.g., "I think I will definitely lose my job if I do not prepare for this meeting"), mindfulness exercises target the worry behavior by promoting the opposite of repetitive negative thinking (i.e., nonjudgmental and nonreactive present moment awareness), thereby facilitating greater psychological distance from negative thoughts. Exposure therapy is often implemented as imaginal exposures for GAD, because individuals with GAD rarely have an external object that is feared. Such imaginal exposures will encourage patients with GAD to write a detailed narrative of their worst-case scenario or catastrophic outcome and then imagine themselves undergoing such an experience without avoiding their emotions. Cognitive restructuring and imaginal exposure exercises can benefit patients with GAD by targeting their tendency to give catastrophic interpretations to their worries, whereas mindfulness can be helpful in targeting worry as a mental behavior itself (5).

Social Anxiety Disorder

Social anxiety disorder involves a fear of negative evaluation in social situations and is accompanied by anxiety and avoidance of interpersonal interactions and performance in front of others. The primary treatment approach for social anxiety disorder consists of exposure exercises to feared social situations (6). Cognitive restructuring is used in conjunction with exposure exercises to reinforce the new learning and shift in perspective occurring through exposure therapy. Typically, exposure exercises for social anxiety disorder come in two stages (6). The first stage of exposures often targets patients' overestimation that something bad will happen during a social interaction. For instance, patients with this disorder may fear that they will make many verbal faux pas (e.g., saying "uh" more than 30 times) during a conversation. An exposure exercise may consist of recording the patient having a 2-minute conversation and listening to the recording afterward to see whether the feared outcome

actually occurred. The second stage of exposure exercises (i.e., social cost exposures) consists of having patients directly making their worst-case social anxiety scenario come true to determine how bad and intolerable it actually is. Such a social cost exposure might involve encouraging a patient to embarrass her- or himself on purpose by singing "Twinkle, Twinkle Little Star" in a crowded public street. After fully confronting a social situation that the patient predicted would be very embarrassing, the patient can then determine whether such a situation is as devastating and intolerable as predicted. After repeated social cost exposures, patients with social anxiety disorder experience less anxiety in embarrassing social situations and are more willing to adopt less catastrophic beliefs about the meaning of making mistakes in social situations.

Obsessive-Compulsive Disorder

Obsessive-compulsive disorder (OCD) is characterized by obsessions (i.e., unwanted thoughts or images that are intrusive in nature) and compulsions (i.e., actions or mental behaviors that are performed in a rule-like manner to neutralize the obsession). A CBT conceptualization of OCD considers compulsions as a form of emotional avoidance. Although both cognitive interventions and exposure exercises are helpful for individuals with OCD, the latter are often emphasized. The gold-standard CBT treatment for OCD is exposure and ritual prevention therapy (7). The primary idea underlying exposure and ritual prevention is to expose individuals with OCD to the feared circumstance associated with the obsession and prevent them from performing the compulsive ritual that gives them comfort through avoidance. For example, patients who experience frequent obsessions about whether their doors are locked or their appliances are off (e.g., "If my door is unlocked, then my house might be robbed or something bad might happen.") will often feel compelled to perform a compulsion (e.g., ritualistic checking) to avoid the likelihood of having their obsession come true. Exposure and ritual prevention would be used to expose such patients to a feared situation, such as leaving their door unlocked on purpose, and resisting the compulsion to check the door or to lock it. During these exposures, the patients would be asked to embrace the uncertainty surrounding the possibility of the feared outcome coming true (i.e., someone entering the house). Repeated sessions of exposure and ritual prevention will facilitate corrective learning about the likelihood that feared outcomes will occur.

Posttraumatic Stress Disorder

As defined by the *DSM-5*, posttraumatic stress disorder (PTSD) can arise after a traumatic event in which an individual directly experiences, witnesses, or learns about the actual or threatened death, serious injury, or sexual violence toward a loved one. After the traumatic stressor event, an individual with PTSD may experience intrusion symptoms (e.g., upsetting dreams or flashbacks of the event), avoidance of reminders of the event, changes in cognitions and affect (e.g., distorted beliefs about oneself, others, and the world), and changes in physiological arousal (e.g., jumpiness, irritability) (4). Gold-standard treatments for PTSD involve targeting the cognitive and behavioral symptoms that maintain the disorder (8). PTSD treatments target negative changes in cognition by restructuring the thoughts and beliefs surrounding the traumatic event. For example, evidence-based treatments alter persistent negative beliefs about the world (e.g., "I was assaulted; therefore, the world is dangerous") to be more flexible (e.g., "even though I was assaulted, there are safe places for me to be"). In challenging these beliefs, the patient may be better able to foster flexible thinking, positive affect, trust, and control in their lives. PTSD treatments are also designed to help patients confront the upsetting memories and situations associated with the traumatic event. Through in-vivo exposures (i.e., approaching situations that are reminders of the trauma) and imaginal exposures (i.e., confronting upsetting memories of the trauma), the patient can begin to behaviorally approach, rather than avoid, reminders of the event to overcome their fears of the trauma and the associated symptoms.

Prolonged Grief Disorder

After losing a loved one, many individuals experience grief symptoms, such as thoughts (e.g., memories of the deceased, memories of the death), emotions (e.g., yearning, emotional pain), and behaviors (e.g., social withdrawal, avoidance of reminders). For most bereaved individuals, these symptoms decrease over time; however, some individuals experience a debilitating syndrome of persistent grief called prolonged grief disorder. This disorder is a direct consequence of the loss, thereby differentiating it from depression and PTSD. Evidence-based and efficacious treatment options for prolonged grief disorder draw from interpersonal therapy, CBT, and motivational interviewing, with additional psychoeducation components (9). These treatments aim to facilitate the natural bereavement process as individuals accept and integrate the loss. Strategies can be either loss-related or restoration-related. Specific loss-related strategies that draw from CBT include imaginal and situational revisiting (e.g., retelling the story of the loss, going to places that have been avoided since the loss) and a grief monitoring diary. Restoration-related strategies include short- and long-term planning, self-assessment and self-regulation, and rebuilding interpersonal connections.

TRANSDIAGNOSTIC APPROACHES TO CBT FOR ANXIETY DISORDERS

Throughout the past several decades, there has been a proliferation of CBT approaches that have been individualized to specific anxiety disorder presentations (e.g., panic disorder, specific phobias, social anxiety disorder). Each disorder-specific treatment manual is written to consider unique applications of CBT strategies for the presenting disorder. However, in recent years, there has been increased interest in considering transdiagnostic approaches to the treatment of anxiety and related disorders (10). The commonalities among individual anxiety

disorders and the high levels of comorbidity have contributed to the rationale for a unified CBT approach that can target transdiagnostic mechanisms underlying all anxiety disorders. The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (UP) has been the most studied transdiagnostic treatment for anxiety disorders, and recent evidence (10) corroborates the equivalent efficacy of the UP relative to disorder-specific treatment protocols for individual anxiety disorders.

The UP consists of five core modules that target transdiagnostic mechanisms of emotional disorders, particularly neuroticism and emotional avoidance, underlying all anxiety disorders. Specifically, the modules are mindfulness of emotions, cognitive flexibility, identifying and preventing patterns of emotion avoidance, increasing tolerance of emotion-related physical sensations, and interoceptive and situational emotion-focused exposures (10). Each module may be used flexibly for individual patients. The first two modules are more cognitive in nature, whereas the latter modules are more behavioral and emphasize the treatment of avoidance. The first module emphasizes mindfulness of emotions, which consists of allowing oneself to fully and nonjudgmentally experience emotions and allow them to come and go while remaining focused on the present. The second module fosters cognitive flexibility by identifying thinking traps that lead to overly negative thoughts and interpretations and by teaching restructuring strategies to generate alternative interpretations of circumstances that are less biased and more adaptive. The third module promotes the identification of emotion-driven behaviors (i.e., actions that a given emotion compels a person to do, such as avoidance behaviors in response to fear) and the adoption of alternative actions (i.e., behaviors that are different from or the opposite of the emotion-driven behavior). For example, if social anxiety prompts an individual to avoid eye contact as an emotion-driven behavior, then an alternative action would be to intentionally maintain eye contact with another speaker to counteract this subtle form of avoidance. The final two modules consist of exposure exercises to develop better tolerance of unwanted physical symptoms produced by anxiety (e.g., increased heart rate) and to reduce fear in anxiety-provoking situations.

Because the UP contains many of the core components of disorder-specific protocols and has demonstrated equivalent efficacy, such a treatment approach may reduce the need for excessive reliance on disorder-specific protocols (10). Furthermore, the UP can be extended to other emotional disorders, such as depression.

COMPLEMENTARY APPROACHES FOR CBT

Mindfulness

Mindfulness-based interventions function both as transdiagnostic adjunctive treatments to CBT for patients with anxiety and stress disorders as well as stand-alone treatments. Mindfulness is the practice of nonjudgmental awareness of the present moment experience. The aim of these interventions is to reduce emotional dysregulation and reactivity to stressors. Common mindfulness-based interventions include manualized group skills training programs called mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (11). MBSR involves eight, 2–2.5-hour sessions with an instructor, in conjunction with a daylong retreat, weekly homework assignments, and practice sessions. Modules are designed to train participants in mindful meditation, interpersonal communication, sustained attention, and recognition of automatic stress reactivity. Mindfulness-based cognitive therapy has a structure similar to MBSR but includes cognitive therapy techniques to train participants to recognize and disengage from negative automatic thought patterns (12). These interventions omit aspects of traditional CBT (e.g., cognitive restructuring). Mindfulness-based interventions have been explored as both brief and Internet-delivered interventions and have been integrated into other evidence-based practices (e.g., dialectical behavior therapy and acceptance and commitment therapy).

Pharmacotherapy

There has been much interest in determining whether combination strategies of CBT and pharmacotherapy yield greater efficacy than either one alone for individuals with anxiety disorders. A comprehensive meta-analysis (13) examining this combination strategy suggested that adding pharmacotherapy to CBT may produce short-term benefit, yet such improvements diminished during 6-month follow-up. This combination strategy was more efficacious for individuals with panic disorder or GAD than for individuals with other presentations of anxiety. Moreover, the meta-analysis (13) indicated that the effect size for CBT combined with benzodiazepines was significantly greater than that for CBT combined with serotonin reuptake inhibitors (SSRIs) or tricyclic antidepressants. Another important consideration for pharmacotherapy in the treatment of individuals with anxiety disorders is to ensure that anxiolytic medications, such as benzodiazepines, are administered carefully in the context of exposure therapy. Anxiolytic medications taken to temporarily reduce anxiety may undermine quality exposure therapy sessions by preventing patients from fully learning whether they can tolerate fear without resorting to avoidance behaviors. Thus, although pharmacotherapy appears to improve outcomes in combination with CBT for patients with anxiety disorders, further research is needed to determine the durability of these effects.

D-Cycloserine in Conjunction With Exposures

One approach for improving patient outcomes is to target the extinction learning process underlying exposure exercises. There has been recent interest in cognitive enhancers, such as d-cycloserine (DCS) or methylene blue, as pharmacological adjuncts to exposure therapy (14, 15). In preclinical studies, DCS has demonstrated evidence as a cognitive enhancer, consolidating new learning during extinction training. Specifically, the efficacy associated with DCS depends on the efficacy of the exposure exercise. For instance, during

a successful exposure exercise, in which anxiety levels decrease substantially, the administration of DCS may confer additional benefit by consolidating this learning. However, if an exposure exercise was unsuccessful and fear levels never decreased, then DCS might consolidate the fear memory, thereby exacerbating the severity of the anxiety disorder (14). Recently, however, there has been evidence (16) suggesting that the efficacy of cognitive enhancers, such as DCS, has been declining, possibly because of changes in dose and dose timing. More research needs to be undertaken to understand under what circumstances (e.g., length of exposure session, amount of fear reduction, timing of dose) DCS would offer the greatest therapeutic effect in conjunction with exposure therapy.

NOVEL DELIVERY METHODS

Internet-delivered CBT (I-CBT) is an alternative modality for the delivery of CBT for patients with anxiety and related disorders. I-CBT is a scalable alternative to in-person treatment, with the Internet used as an accessible and cost-effective method of delivery for evidence-based treatment. In I-CBT, CBT modules are delivered via computer or an application on a mobile device, with the support of a therapist or through a self-guided system. I-CBT has been shown (17–19) to be superior to waitlist and placebo conditions in the treatment of adults with a range of anxiety and trauma disorders, including anxiety and PTSD. Results (18) have indicated that I-CBT is similarly effective at reducing panic disorder symptoms as face-to-face CBT. The results of another trial (20) have indicated that I-CBT is also effective at reducing symptoms of OCD and social anxiety disorder.

In addition to Internet and mobile application platforms for CBT, virtual reality technology offers novel avenues to access cognitive-behavioral interventions (21). One key advantage is that recent advances in the sensory vividness of virtual reality platforms have facilitated more meaningful exposure exercises. For example, virtual reality flight simulators can be leveraged to expose a patient with flight phobia to several flight conditions with enhanced sensory detail (e.g., sounds of liftoff or landing, vibrations, images of clouds through a window, images of in-cabin atmosphere). This technology could obviate the need to purchase several expensive flights to participate in exposure exercises, thereby permitting more frequent exposure opportunities.

CONCLUSIONS

CBT is an effective, gold-standard treatment for anxiety and stress-related disorders. CBT uses specific techniques to target unhelpful thoughts, feelings, and behaviors shown to generate and maintain anxiety. CBT can be used as a standalone treatment, may be combined with standard medications for the treatment of patients with anxiety disorders (e.g., selective serotonin reuptake inhibitors), or used with novel interventions (e.g., mindfulness). Furthermore, this treatment is flexible in terms of who may benefit from it. Overall, whenever a patient is experiencing some form of emotional psychopathology (e.g., an anxiety or depression disorder) or distressing emotions that do not meet disorder threshold but cause distress or interference in daily activities, referral to a CBT provider is indicated to pursue a course of treatment to actively address such symptoms and problems.

AUTHOR AND ARTICLE INFORMATION

Department of Psychiatry, Massachusetts General Hospital, Boston (all authors); Department of Psychiatry, Harvard Medical School, Boston (Curtiss, Baker). Send correspondence to Dr. Curtiss (jcurtiss@mgh.harvard.edu).

The authors report no financial relationships with commercial interests.

REFERENCES

1. Kessler RC, Petukhova M, Sampson NA, et al: Twelve-month and lifetime prevalence and lifetime morbid risk of anxiety and mood disorders in the United States. Int J Methods Psychiatr Res 2012; 21:169–184
2. Hofmann SG, Asmundson GJ, Beck AT: The science of cognitive therapy. Behav Ther 2013; 44:199–212
3. Beck AT, Emery G, Greenberg RL: Anxiety Disorders and Phobias: A Cognitive Perspective. New York, Basic Books, 2005
4. Diagnostic and Statistical Manual of Mental Disorders, 5th ed. Washington, DC, American Psychiatric Association, 2013
5. Hofmann SG, Carpenter J, Curtiss JE, et al: The Anxiety Skills Workbook: Simple CBT and Mindfulness Strategies for Overcoming Anxiety, Fear, and Worry. Oakland, CA, New Harbinger, 2020
6. Hofmann SG, Otto MW: Cognitive Behavioral Therapy for Social Anxiety Disorder: Evidence-Based and Disorder Specific Treatment Techniques. New York, Routledge, 2017
7. Foa EB, Yadin E, Lichner TK: Exposure and Response (Ritual) Prevention for Obsessive Compulsive Disorder: Therapist Guide. New York, Oxford University Press, 2012
8. Resick PA, Nishith P, Weaver TL, et al: A comparison of cognitive-processing therapy with prolonged exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape victims. J Consult Clin Psychol 2002; 70:867–879
9. Shear MK: Complicated grief treatment: the theory, practice and outcomes. Bereave Care 2010; 29:10–14
10. Barlow DH, Farchione TJ, Bullis JR, et al: The unified protocol for transdiagnostic treatment of emotional disorders compared with diagnosis-specific protocols for anxiety disorders: a randomized clinical trial. JAMA Psychiatry 2017; 74:875–884
11. Hofmann SG, Gómez AF: Mindfulness-based interventions for anxiety and depression. Psychiatr Clin North Am 2017; 40:739–749
12. Segal ZV, Williams JMG, Teasdale JD: Mindfulness-Based Cognitive Therapy for Depression: A New Approach to Preventing Relapse. New York, Guilford, 2002
13. Hofmann SG, Sawyer AT, Korte KJ, et al: Is it beneficial to add pharmacotherapy to cognitive-behavioral therapy when treating anxiety disorders? A meta-analytic review. Int J Cogn Ther 2009; 2:160–175
14. Curtiss J, Carpenter J, Kind S, et al: Incorporating Memory Enhancers into the Treatment of Anxiety and Related Disorders, 2nd ed. Oxford, UK, Elsevier, 2016
15. Zoellner LA, Telch M, Foa EB, et al: Enhancing extinction learning in posttraumatic stress disorder with brief daily imaginal exposure and methylene blue: a randomized controlled trial. J Clin Psychiatry 2017; 78:e782–e789
16. Rosenfield D, Smits JAJ, Hofmann SG, et al: Changes in dosing and dose timing of D-cycloserine explain its apparent declining efficacy

for augmenting exposure therapy for anxiety-related disorders: an individual participant-data meta-analysis. J Anxiety Disord 2019; 68:102149
17. Reger MAGG, Gahm GA: A meta-analysis of the effects of internet- and computer-based cognitive-behavioral treatments for anxiety. J Clin Psychol 2009; 65:53–75
18. Sijbrandij M, Kunovski I, Cuijpers P: Effectiveness of internet-delivered cognitive behavioral therapy for posttraumatic stress disorder: a systematic review and meta-analysis. Depress Anxiety 2016; 33:783–791
19. Stech EP, Lim J, Upton EL, et al: Internet-delivered cognitive behavioral therapy for panic disorder with or without agoraphobia: a systematic review and meta-analysis. Cogn Behav Ther 2020; 49: 270–293
20. Matsumoto K, Sutoh C, Asano K, et al: Internet-based cognitive behavioral therapy with real-time therapist support via videoconference for patients with obsessive-compulsive disorder, panic disorder, and social anxiety disorder: pilot single-arm trial. J Med Internet Res 2018; 20:e12091
21. Valmaggia LR, Latif L, Kempton MJ, et al: Virtual reality in the psychological treatment for mental health problems: an systematic review of recent evidence. Psychiatry Res 2016; 236:189–195