

# Cognitive Behavior Therapy for Panic Disorder

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**Abstract:** Panic Disorder affects around 3.5% of the population during their lifetime, affecting twice as many women. It is often comorbid with depression and other anxiety disorders. Panic disorder can be assessed by a variety of interviews and self-report questionnaires. The theoretical model underlying CBT explains panic from both a learning perspective as well as a cognitive one. Treatment comprises of both behavioral and cognitive components. Treatment outcome studies show that CBT is an effective, acceptable and cost-effective treatment for Panic Disorder.

## Background

Panic attacks are defined by the DSM-IV-TR (1) as discrete periods of intense fear or discomfort in which four or more of the following symptoms are found: palpitations, pounding heart, increased heart rate, sweating, trembling, shaking, sensations of shortness of breath or smothering, feeling of choking, chest pain or discomfort, nausea or abdominal distress, feeling dizzy, unsteady, light-headed or faint, derealization, depersonalization, fear of losing control or going crazy, fear of dying, numbness or tingling, chills or hot flushes. These symptoms occur abruptly and reach a peak within ten minutes. Panic attacks may occur in many anxiety disorders, for instance on exposure to the feared object in specific phobia, the fear-provoking memory in PTSD, or the obsessive thought in OCD, and are not in and of themselves considered an anxiety disorder.

Lifetime prevalence estimates for isolated panic attacks is 22.7% (2). Panic Disorder is defined by DSM-IV as the occurrence of unexpected, recurrent panic attacks, with at least one of the attacks being followed by one month (or more) of either a) persistent concern about having another attack or b) worry about the implications of that attack or its consequences or c) a significant change in behavior related to the attacks (or all three).

Panic disorder may or may not be accompanied by agoraphobia. Agoraphobia is defined as anxiety

about being in places or situations from which escape may be difficult (or embarrassing) or in which help may not be available in the event of having an unexpected or situationally predisposed panic attack or panic symptoms. Typical fears involve situations of being alone, being in crowds, public transportation, theaters, etc. These situations are avoided or endured with distress. Approximately one-third to one-half of patients diagnosed with panic disorder also have agoraphobia (1) Lifetime prevalence of panic disorder is 3.5% (2). It is twice as common in women. The age of onset is mid-adolescence through age 40 (mean = 26 years).

Co-occurrence of panic disorder with other anxiety disorders and depression is common. Comorbidity of panic with depression ranges from 10% to 65% and in approximately two-thirds of the cases depression occurs simultaneously or following the onset of panic. Co-morbidity with social phobia and generalized anxiety disorder is 15–30%, obsessive-compulsive disorder is 10% and specific phobia and PTSD is 2–20% (1).

## Assessment

Structured interviews used to assess Panic Disorder include the Structured Clinical Diagnostic Interview (3) and the Anxiety Disorders Interview Schedule (4).

Many self-report questionnaires exist to record the intensity and frequency of panic symptoms,

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fear and avoidance. The most common ones, which exhibit good reliability and validity include the Panic Disorder Severity Scale (PDSS)(5), the Fear Questionnaire (6) (FQ) which assesses avoidance in panic disorder (7), Agoraphobic Cognitions Questionnaire(8) (ACQ), and the Body Sensations Questionnaire (8)(BSQ), the Mobility Inventory used to assess agoraphobic avoidance and distress (9), and the Anxiety Sensitivity Index (ASI)(10).

In addition to assessment of the subjective experience of panic, behavioral tests are helpful in determining severity of symptoms and in planning individualized treatment. Behavioral tests require the performance of avoided or anxiety producing behaviors and are individually tailored for each patient. Levels of fear (measured using the Subjective Units of Distress Scale, SUDS) experienced during the performance of each task are recorded.

Safety behaviors must be assessed carefully because they are used by panic patients to “prevent” a panic attack. These may include not leaving the house without anti-anxiety medication, slow breathing, carrying a cell phone so they can call for help at any moment, vomit bag, paper bag for breathing, water, or a comfort person. Similarly, places and bodily sensations must also be assessed. Avoidance of places may include bridges, malls, theaters, driving, standing in line, public transportation, closed spaces, open spaces, public bathrooms, elevators, escalators, staying home alone, going out alone, going to a new place, amusement parks, sleeping away from home. Feared sensations that may be avoided include increased heart rate and any activity that elicits it such as exercise, sexual activity, drinking coffee or eating sugar, walking quickly, suspense/scary movies, feeling hot and sweaty which can manifest itself in dressing in light clothing, using air conditioning when not necessary, avoiding sauna/whirlpool. To avoid unpleasant stomach sensations patients may avoid eating certain foods, drinking alcohol or allowing themselves to become hungry.

## Theoretical Models

The cognitive behavior model of panic (11, 12) describes both the development and the maintenance of the disorder. This model emphasizes that fear

is a natural and helpful response to danger: the ability to fight or run when a predator is present contributes to species survival. In panic disorder, individuals learn to fear this natural reaction: they develop “fear of fear,” and specifically are fearful about the physiological changes associated with increased arousal.

The model postulates that certain individuals are more likely to acquire this fear. This vulnerability is influenced by genetic factors (13), a general psychological vulnerability to respond to stress with a fear reaction, and a specific sensitivity to anxiety symptoms. This specific vulnerability includes a greater likelihood of perceiving somatic changes, as well as a greater risk of perceiving them as dangerous.

The natural fear response described above can also occur when there is no danger actually present: a “false alarm” (14). For many people, false alarms may occur, and then be quickly forgotten. For certain people, who have the particular vulnerability outlined above, this false alarm will be considered dangerous, and will create arousal and attention. Via conditioning, false alarms will be associated with internal bodily changes: interoceptive changes.

Concern about a subsequent false alarm (i.e., panic attack) will lead to anticipatory anxiety about such an attack. Additionally, interoceptive changes that have become associated (via classical conditioning) with the panic attack are sufficient to trigger a panic attack. For instance, the false alarm panic attack included an elevated heart rate. Subsequent to this panic attack, the individual may experience elevated heart rate (for instance when exercising): full-blown panic will occur since the somatic change has been associated as a cue for the alarm. Fear of a subsequent attack will lead to behavioral changes, such as avoidance of exercising. The avoidance will be maintained via negative reinforcement – if I don’t exercise then I don’t get a panic attack. This model also explains the occurrence of nocturnal panic attacks (panic attacks that happen as the person wakes, with no external cue [15]) and panic attacks during relaxation (16). Both sleep and relaxation result in somatic changes, such as slower breathing, which may have become associated with the false alarm, leading to a panic attack.

A second factor which maintains the “fear of fear” is a cognitive one. Clark (12) proposed that following the first experience of a panic attack an individual may become more alert to internal physiological changes, and may interpret these wrongly. For instance, after running for a bus, and experiencing increased heart rate and shortage of breath, a non-panicker might not consider these physiological changes as at all important, or may simply think, “I am really not fit, I ought to get to the gym more often.” People with panic disorder will give catastrophic interpretations to these changes, such as, “I am having a heart attack” or “I am having a panic attack.” In the latter example, this individual might logically present herself to the local ER, complaining of [real] physiological changes that are worrying. These negative interpretations may be linked to an underlying schema such as “it’s important to be in control all the time.”

Research studies support many of the elements of this model. Many studies have shown that the vast majority of people with panic disorder report stressful life events in the period before their first panic attack (17). Other studies have demonstrated the occurrence of panic attacks following physiological changes (18). Studies have shown that people with panic attacks are more likely than controls to notice and misinterpret internal bodily changes (19, 20).

## Treatment

CBT for panic disorder includes several treatment components. Firstly, psycho-education is essential for understanding and learning to manage panic. Psycho-education includes becoming familiar with the panic model, that panic symptoms are not dangerous, but rather reflect autonomic nervous system arousal that detects danger that does not exist, and that avoidance maintains the fear.

Early models of panic control treatment used somatic management as an integral component of treatment. Patients were taught to use diaphragmatic breathing, progressive muscle relaxation and cued relaxation to help decrease the autonomic arousal. It was believed that patients with panic have increased anxiety sensitivity and thus somatic management is important to help them manage

their anxiety. Recent research does not support the use of relaxation techniques as they may detract from the patient’s ability to tolerate the anxiety and some may use them as safety behaviors (11).

The second component of treatment is cognitive restructuring (CR). CR takes the form of discussion and verbal processing and is used to help the patient identify the thoughts or cognitions that run through his/her head when s/he feels the anxiety sensations. The two central cognitive errors that panic patients make are overestimation of danger and catastrophizing. Overestimation of danger is defined as overestimating the probability of something negative happening, e.g.: What if I have a heart attack? What if I die? Here, patients are taught to challenge the thought by (1) treating the thought as a hypothesis, (2) reviewing evidence for and against the thought, and (3) coming up with a conclusion that is based upon the evidence. Evidence might include the physiological symptoms (supports the thought that I might die), and previous experience (this has happened before and I am still alive, evidence against the thought). The conclusion might be that although I feel terrible, this probably does not mean that I will die. Catastrophizing is defined as predicting the outcome of events to be much worse than they actually are: “making a mountain out a molehill,” for example, I will faint in front of everyone. Patients are taught to examine and challenge these thoughts using techniques such as, (1) imagining the worst case scenario, (2) critically analyzing it, (3) assessing the hassle or horror of it, (4) determining if it will really change their life, and (5) deciding what is their ability to cope with such a scenario. Socratic questioning is used to come up with responses or alternative thoughts that are written on coping cards and carried around with the patient. Some patients may need to work on their core beliefs (e.g., I must be in control all the time) in addition to their automatic negative thoughts about having a panic attack (e.g., if I have a panic attack I will lose control of my bodily functions).

A third component of treatment is exposure, a behavioral intervention where patients experience the sensations or places they have been avoiding in an effort to not experience the feared sensation or another panic attack. The treatment of panic

disorder includes two types of exposure: interoceptive exposure and in-vivo exposure. Interoceptive exposure requires the patients to expose themselves to the feared bodily sensations and includes several techniques that will induce these sensations. For example, straw breathing can be used to experience breathlessness, head rolling or spinning around in a chair to experience dizziness, stair running to experience heart racing, hyperventilation to experience several symptoms (dry mouth, heart racing, dizziness, choking), hand starting to experience derealization and throat constriction to experience choking. Patients are exposed to all of these in session, and then a hierarchy is built based on the results.

Similarly with in-vivo exposure the therapist and patient create a list of all avoided situations. These are rated according to the difficulty they cause, and this hierarchy is used to plan exposures; typically exposures are carried out in a systematic fashion beginning with a situation which results in only a moderate amount of fear. The mobility inventory is a helpful tool to use to develop a hierarchy of feared or avoided situations. In both interoceptive and in-vivo exposures, the patient is systematically exposed to each of these situations and is required to stay in the situation until their anxiety levels decrease. Interoceptive exposure may in fact be done during in-vivo exposure to increase the impact. It is important to ensure that patients are not using safety behaviors (e.g., breathing, checking, drinking, etc.) while they are engaged in the exposure exercises. The goal is for the anxiety to be decreased through tolerance and not avoidance or distraction from it. Thus, safety behaviors must be gradually extinguished as exposure is taking place. Patients are required to complete exposure homework on a daily basis recording their anxiety levels at the beginning and end of each exposure session.

CR is done through Socratic questioning as is typical in cognitive therapy (see 11 for a review of cognitive therapy). Patients are taught to carry the alternative responses written on cards labeled “coping cards” with them as these alternative, rational thoughts often “fly out the window” when the patients are faced with anxiety.

The final phase of treatment is called relapse prevention. Relapse prevention, as its name implies,

is taught to help patients review what they learned, identify potentially difficult situations that may trigger an attack and help them use their skills to prevent future attacks or to manage their anxiety should an attack occur. Throughout the course of treatment patients are reminded that the goal is not to be panic free (though this may in fact happen and does to a high percentage of panic patients), but rather to learn to control or manage their anxiety and attacks.

Treatment ranges from 12–15 sessions. Sessions are held weekly and at the end bi-weekly with a monthly follow-up.

## Treatment Outcome Studies

There have been over 300 randomized controlled trials examining cognitive behavior therapy for panic disorder. The major conclusions from these studies will be presented here. A meta-analysis of 124 outcome studies showed that CBT is more effective than control conditions (no treatment or placebo); it is at least as effective as pharmacological therapy, and sometimes superior to it (21).

### 1) Predictors of outcome

Poorer treatment outcome has been found to be associated with younger age of onset, co-morbid social anxieties and higher pre-treatment symptoms of panic and agoraphobia (22, 23). A recent study of panic disorder in Japan (24) showed that poorer outcome was predicted by duration of the disorder and the extent of social dysfunction. Another study (25) showed that poor motivation on the part of the patient, combined with greater adherence by a therapist to a standardized protocol, is related to poorer outcome. Patients with high motivation were not affected by the level of adherence. Brief CBT is as effective as standard CBT (26), although it may be less robust with patients who exhibit more symptoms before treatment (27).

### 2) Mechanism of change in CBT

A recent study analyzed the data from a large outcome study (28). Ninety-one patients were treated with CBT alone, CBT and Placebo, CBT and imipramine and imipramine alone. Catastrophic cognitions were assessed, and these were found

to mediate outcome only in those patients treated with CBT. Specifically, cognitions regarding physical sensations were the most salient. Similarly, it has been shown that a reduction in the “fear of fear” mediates the treatment effect of CBT (29).

In a study (30) examining only cognitive therapy without breathing retraining or exposure, this treatment was shown to be successful, when it focused on bodily sensations. In another study (31), regular exposure was compared with exposure treatment that focused on disconfirming feared outcomes. The latter was more effective at reducing symptoms.

### 3) Combination with SSRI treatment

Both CBT and pharmacological therapy have been demonstrated as effective treatments for PD (32). A recent study (33) analyzed the cost-effectiveness of these therapies, both individually and in combination. The results show that individual therapies are more cost-effective, with pharmacotherapy more so at the end of active treatment, whereas CBT shows more cost-effectiveness at the end of long-term follow-up.

## Conclusions

Panic disorder is common, and can lead to significant disruption in daily functioning. Panic attacks are understood to arise via classical conditioning following fear, and are maintained by negative reinforcement and catastrophic beliefs about the attacks. Both behavioral and cognitive techniques are effective in treating panic disorder. Treatment outcome studies show that CBT for panic disorder is both extremely effective as well as cost-effective.

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