

PSYCHOLOGY APPLIED TO TERRORISM: PSYCHOLOGICAL TREATMENT
FOR VICTIMS OF TERRORIST ATTACKS

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In recent years, terrorism has become one of the most severe and alarming problems worldwide. According to the data of the National Counterterrorism Center (NCTC) of the United States of America, in the past four years (2005-2008), a yearly average of 12,933 terrorist attacks have occurred, causing approximately 18,406 deaths, 35,338 injured, and 15,141 hostages each year (NCTC, 2006, 2007, 2008, 2009). Although during this interval, most of the terrorist attacks have been concentrated in the Near East (approximately 46%) and in South Asia (approximately 30%), and, specifically, in countries like Iran, Afghanistan, Pakistan, or India, the plague of terrorism affects all regions of the world to a greater or lesser degree (NCTC, 2006, 2007, 2008, 2009).

Research on the psychopathological consequences of traumatic events such as war has a long history in Psychiatry and Psychology, concerning both soldiers (e.g., Miller, 1920) and civilians (e.g., Baumgarten-Tramer, 1948). This tradition is very much recent in the case of terrorism, although, for some time, the psychopathological consequences of terrorist attacks and the need for their treatment have been pointed out in the psychiatric and psychological literature (Curran, 1988). However, until almost 10-15 years ago, no systematic investigation programs of either of these issues were developed. In fact, the most solid information available about the mental health problems derived from terrorist attacks and their treatment is practically limited to that obtained after investigating a much reduced number of attacks. Specifically, the attacks carried out in developed countries and, particularly, those that occurred in the past 15 years in the USA, Israel, and Western Europe (Spain, France, Ireland, and the United Kingdom) and which caused a large number of deaths and injuries, such as, for example, the April 19th attack in Oklahoma, the August 15th attack in Omagh (Northern Ireland), the attacks of September 11th, 2001, in New York and Washington

DC, the attacks of March 11th, 2004, in Madrid, or the attacks of July 7th, 2005, in London.

However, bearing this limitation in mind, it must be acknowledged that in recent years, such research has grown rapidly and fruitfully so that if, at the beginning of this century, a large part of the knowledge of the mental disorders caused by terrorism and, in particular, of the treatment of people affected by such disorders, came from the more extensive scientific literature on traumatic events (i.e., rape, physical and sexual abuse, car accidents, robbery with violence), including that dedicated to all kinds of disasters (i.e., wars, serious train, plane, or boat accidents, flash floods, fires, earthquakes), currently the knowledge of mental health problems derived specifically from terrorism has led to various meta-analyses (DiMaggio & Galea, 2006; DiMaggio, Galea, & Li, 2009), and the literature on the treatment of such mental problems now includes more than half a dozen empirical studies with group designs, including some experimental ones (Difede, Malta, et al., 2007; Duffy, Gillespie, & Clark, 2007).

The purpose of this chapter is to review the empirical studies on the psychological treatment of people affected by the attacks, with the conviction that any strategy or plan to attend to the mental health of the victims of terrorist attacks must use the intervention methods that receive the most empirical support concerning their efficacy and effectiveness.

Psychological Treatment of the Psychopathological Repercussions of Terrorist Attacks

From meta-analytic (e. g., DiMaggio & Galea, 2006; DiMaggio, Galea, & Li, 2009) and narrative reviews (e.g., Bills et al., 2008; García-Vera & Sanz, 2008) on the psychopathological repercussions of terrorist attacks, it derives that, after terrorist attacks, an important percentage of direct victims (around 20-30%) will develop a post-traumatic stress disorder (PTSD) as well as other mental disorders, mainly, major

depression disorder, panic disorder, generalized anxiety disorder, agoraphobia, and alcohol and other substance dependence/abuse disorders. The percentage of indirect victims who will develop those disorders will be lower, but nonetheless over the habitual prevalence of the above mentioned disorders in the general population before the terrorist attacks. Consequently, both direct and indirect victims will need short-, medium-, and long-term psychological attention.

This psychological attention should take into account the diverse needs and characteristics of the affected individuals, the fact that such needs have different priorities and can vary at different moments or phases after the attacks, and the commitment and suitability of integrating psychological interventions within a global response plan (National Institute of Mental Health [NIMH], 2002).

Taking this global action context into account, the following sections will focus on the treatment of the victims with psychological disorders derived from terrorist attacks on the psychological action phases known as recovery phase (1-4 weeks) and return to life (2 weeks-2 years) (NIMH, 2002). The reader is referred to other works (Foa et al., 2005; Institute of Medicine Committee on Responding to the Psychological Consequences of Terrorism, 2003; NIMH, 2002) for a more detailed presentation of other kinds of psychological actions and of the most suitable interventions and psychological treatments in earlier action phases.

Treatment of Post-Traumatic Stress Disorder

PTSD is the most frequent disorder after the experience of a traumatic event, including a terrorist attack (DiMaggio & Galea, 2006; García-Vera & Sanz, 2008; Norris, Friedman, Watson, Byrne, Diaz, & Kaniasty, 2002). Consequently, most research on the psychological treatment of the victims of terrorism has focused on this disorder.

Until nearly about 7-8 years ago, there were practically no published empirical studies on the specific psychological treatment of PTSD derived from terrorist acts, so the recommendations of the treatments that should be applied to the victims of terrorism were based on the literature about the efficacy of the psychological treatments of PTSD in people who had experienced other types of traumatic events, including war veterans, victims of physical violence or rape, refugees, or traffic-accident survivors.

Fortunately, this empirical literature is very abundant and it has allowed us to carry out numerous meta-analytical reviews (Australian Centre for Posttraumatic Mental Health, 2007; Bisson & Andrew, 2007; Bisson, Ehlers, Matthews, Pilling, Richards, & Turner, 2007; Bradley, Greene, Russ, Dutra, & Westen, 2005; National Institute for Health and Clinical Excellence [NICE], 2005) and narratives (Cloitre, 2009; Institute of Medicine Committee on Treatment of Posttraumatic Stress Disorder, 2007) of experimental studies with control group (or randomized controlled clinical trials), which provide solid conclusions about the treatments with the greatest empirical support regarding their efficacy for PTSD, and, on the basis of these conclusions, it has allowed diverse scientific societies and panels of experts to elaborate guidelines of clinical practice that coincide to a great extent in their therapeutic recommendations of psychological treatments for PTSD (American Psychiatric Association, 2004; Australian Centre for Posttraumatic Mental Health, 2007; Institute of Medicine Committee on Treatment of Posttraumatic Stress Disorder, 2007; NICE, 2005; NIMH, 2002).

Specifically, according to this empirical literature and these guidelines of clinical practice, the treatments with the greatest empirical guarantees are currently: exposure therapies, trauma-focused cognitive-behavioral therapies (which include cognitive restructuring techniques and exposure techniques), anxiety control training (or

stress-inoculation training), and eye movement desensitization and reprocessing (EMDR), although there is some debate about the last therapy with regard to whether its efficacy is mainly due to the exposure and cognitive restructuring components included therein, and whether the other, not strictly cognitive-behavioral, components of the therapy, including the eye movement, are unnecessary (Australian Centre for Posttraumatic Mental Health, 2007; Lohr, Hooke, Gist, & Tolin, 2004).

In fact, most of those guidelines of clinical practice suggest that, on the basis of current scientific knowledge, these psychological therapies should be considered the treatments of choice for PTSD (Australian Centre for Posttraumatic Mental Health, 2007; Institute of Medicine Committee on Treatment of Posttraumatic Stress Disorder, 2007; NICE, 2005; NIMH, 2002), over and above other popular psychological therapies (e.g., psychological debriefing) or psychopharmacological therapies.

Efficacy of the Psychological Treatments for PTSD in Victims of Terrorism

Recently, the results of two experimental studies with control group were published that suggest that the level of efficacy of trauma-focused cognitive-behavioral therapy for the direct or indirect victims of terrorist attacks who suffer from PTSD is similar to the efficacy of this therapy with patients who suffer from PTSD due to other kinds of traumatic situations. The main characteristics and the most important results of both studies are displayed in Table 1.

Insert Table 1 about here

The first of the experimental studies was carried out by Duffy, Gillespie, and Clark (2007) with a sample of 59 patients that included people injured in terrorist acts and other civil conflicts in Northern Ireland, as well as people who had experienced

these events but who had not been injured in them (direct witnesses) and indirect witnesses of these traumatic situations, all of them diagnosed with chronic PTSD. The authors randomly assigned these patients either to a group that received trauma-focused cognitive-behavioral therapy following the cognitive model of Ehlers and Clark (2000) of persistent PTSD, or to a waiting-list control group, which, after posttreatment assessment, also received the cognitive-behavioral therapy.

The therapy based on Ehlers and Clark's model is essentially cognitive, as its final goals, in accordance with the assumptions of the model, are: (1) to elaborate and integrate the traumatic memory within the context of the individual's experience and thus reduce its intrusive experience; (2) modify the negative appraisals of the traumatic situation or of its sequelae, and (3) abandon the cognitive and behavioral strategies (i.e., avoidance of situations or thoughts) that prevent elaboration of the memory, exacerbate the symptoms, or hinder reassessment of the negative appraisals (Gillespie, Duffy, Hackmann, & Clark, 2002). For this purpose, the therapy includes various cognitive strategies to evoke and reappraise the patients' negative evaluations and dysfunctional attitudes, especially strategies of cognitive restructuring based on designing behavioral experiments in which the patients test their negative appraisals of the trauma and its consequences and their beliefs about the usefulness of their dysfunctional strategies. But, as is usual with cognitive-behavioral therapies for PTSD, in order to achieve the goals, the treatment applied by Duffy et al. (2007) also used imaginal exposure (visualizing the attack and reliving it in the present, including thoughts and feelings) intensively, and even, when considered necessary, in vivo exposure (direct exposure to the real situations and stimuli associated with the attack), so it could be better conceptualized as a cognitive-behavioral therapy rather than a purely cognitive one.

The results of the study of Duffy et al. (2007) confirmed the efficacy of this kind of cognitive-behavioral therapy for the treatment of the direct and indirect victims of terrorist attacks, because at posttreatment, the patients of the group that received this therapy showed statistically significant improvement in comparison to the patients from the waiting-list control group, revealing pre-posttreatment changes with a large effect size (that is, with a within-group effect size $> .80$) in practically all the measures of symptomatology and dysfunctionality applied, including a measure of symptoms of posttraumatic stress: the Posttraumatic Stress Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997). In fact, these changes were maintained in the treatment group at the 1-month, 4-month and 1-year follow-ups (see Table 1).

Moreover, taking into account the results of both groups of patients once the control group had also received trauma-focused cognitive-behavioral therapy, and defining clinically significant improvement as a reduction of at least 50% of the posttraumatic stress symptomatology assessed at pretreatment with the PDS, it could be estimated that 56.1% of the patients presented a clinically significant improvement after the therapy.

In line with these results, the second experimental study (Difede, Malta et al., 2007) corroborated the efficacy of trauma-focused cognitive-behavioral therapy in the specific case of the disaster workers who helped in the S-11 terrorist attacks of the World Trade Center and who suffered a diagnosable PTSD or high levels of posttraumatic stress symptomatology. In this study, the cognitive-behavioral therapy that the 15 patients who were randomly assigned to the treatment group received included breathing training, cognitive reprocessing, imaginal exposure, and gradual in vivo exposure, with particular emphasis on the latter two components. In contrast, the 16 patients randomly assigned to the control group received the habitual intervention for

this type of workers which, in this case, consisted of providing information about the results of the pretreatment psychological assessment, and advising them to seek treatment for PTSD, and remitting them to the appropriate professionals to help them obtain this treatment through community resources, although, in the course of the study, none of these patients sought treatment.

Although at posttreatment, the patients who received cognitive-behavioral therapy showed lower levels of posttraumatic stress symptomatology than the patients of the control group, these differences were not statistically significant when taking into account the data of all the patients who initiated the study, both those who completed the treatment and those who dropped out of the study prematurely. However, when only considering the data of the patients who completed the treatment, the results indicate that the patients who received cognitive-behavioral therapy showed—statistically significant—lower levels of posttraumatic stress symptoms than the patients from the control group in the two standardized measures of PTSD, and the group differences in these measures were of a magnitude that was much higher than the value conventionally considered a large effect size (effect size $> .80$; see Table 1). In fact, considering a 10-point reduction in the Clinician Administered PTSD Scale (CAPS; Blake, Weathers, Nagy, Kaloupek, Charney, & Keane, 1995) to be a clinically significant improvement, 78.1% of the patients who completed the cognitive-behavioral therapy improved in a clinically significant way versus only 28.6% of the patients from the control group (see Table 1).

Summing up, the results of the two experimental studies carried out to date on the treatment of victims of terrorism who suffer from PTSD suggest that trauma-focused cognitive-behavioral therapy is efficacious for this kind of disorders and, therefore, it would be the therapy of choice in the absence of studies on the specific

efficacy in victims of terrorism of the other psychological therapies that have been shown to be efficacious for PTSD derived from other traumatic events (exposure therapy, anxiety control training, and EMDR), and, of course, above and beyond other psychological or psychopharmacological therapies that not only have not been tested with victims of terrorism, but which also lack adequate empirical support for their efficacy in PTSD produced by other traumatic situations.

Nevertheless, this recommendation should be taken with due caution, not only because it is based on a very reduced number of studies, but also because in one of the studies, that of Difede, Malta et al. (2007), a high rate of drop-outs was found in the group that received the cognitive-behavioral therapy (53.3%), at least in comparison with the usual drop-out rate in studies of psychological therapy of PTSD, which, in the meta-analysis of Bradley et al. (2005), was estimated at 21%, precisely the rate also found for all the patients of the study by Duffy et al. (2007) when they started the cognitive-behavioral therapy (20%).

On the other hand, on the basis of the literature on PTSD due to other traumatic situations, it could be expected that future experimental research will confirm that some of the other psychological treatments, if not all of them, that have proven their efficacy for victims of these other situations, will also be effective for the victims of terrorism.

Clinical Effectiveness of Psychological Treatments for PTSD in Victims of Terrorism

The two studies cited in the previous section were designed to assess the efficacy of cognitive-behavioral therapy, not their clinical effectiveness (or clinical utility). As with other experimental studies with control group, such studies are characterized by lending priority to internal validity in their designs and thus, allowing them to infer the existence of a causal relation between the therapies and the positive results observed upon completion. For this purpose, researchers prepare the most optimum and

controlled conditions possible to allow them to detect any minimal positive effect that can be attributed exclusively to the treatment (e.g., strict inclusion and exclusion criteria, homogeneous samples, random assignment of the patients to a treatment group or to a control group, therapists with very similar training, university or research therapeutic contexts, treatment manuals, defined therapeutic protocols with regard to the number of sessions and their duration, assessment of the degree of fidelity to the protocols and manuals). As they lend priority to internal validity, such studies partially sacrifice external validity and, therefore, it is unclear whether the positive effects found in these ideal and controlled conditions are at all generalizable to the habitual clinical practice in which one intervenes on a much more heterogeneous population that has some capacity to choose the type of treatment it will receive, and in which the administration of treatments is flexible, self-corrective, and in charge of clinical professionals who vary much more in their degree of training and clinical experience.

Studies that directly address the clinical utility of an intervention that has previously proved its efficacy by examining its effects in conditions similar to those found in the habitual clinical practice are known as effectiveness studies. The main characteristics of such studies is that they give priority to external validity and, therefore, they examine the effects of treatments in conditions as similar as possible to those that of the habitual clinical practice (e.g., natural therapeutic contexts, clinical professionals who work in such contexts, samples of more heterogeneous patients, who are selected with hardly any exclusion or inclusion criteria from among the people who normally come to consultation or are remitted to such contexts).

Although there are not many studies that have addressed the clinical effectiveness of psychological treatment for PTSD, strangely enough, with regard to the victims of terrorism, four studies have been published to date (Brewin, Scragg,

Robertson, Thompson, d'Ardenne, & Ehlers, 2008; García-Vera & Romero Colino, 2004; Gillespie et al., 2002; Levitt, Malta, Martin, Davis, & Cloitre, 2007) that meet many of the characteristics of clinical effectiveness studies. These four studies are also displayed in Table 1. All of them used a pre-posttreatment within-group design and analyzed the results of the administration of trauma-focused cognitive-behavioral therapy for PTSD with heterogeneous samples of direct and indirect victims of terrorist attacks.

In two of them, the clinical effectiveness of two specific cognitive-behavioral therapies was analyzed. In the study of Gillespie et al. (2002), with a sample victims of the car bomb that exploded in Omagh (Northern Ireland), the effectiveness of the cognitive-behavioral therapy developed from the cognitive model of Ehlers and Clark (2000) was examined. This therapy has been analyzed with regard to its efficacy with victims of terrorism, in the above-mentioned experimental study of Duffy et al. (2007). In the study of Levitt et al. (2007), the clinical effectiveness with direct and indirect victims of the S-11 terrorist attacks at the World Trade Center of the cognitive-behavioral therapy called Skills Training in Affective and Interpersonal Regulation/Modified Prolonged Exposure (STAIR) was examined. The efficacy of this treatment had been previously demonstrated for PTSD derived from infant abuse in a randomized and controlled clinical trial carried out by Cloitre, Koenen, Cohen, and Han (2002).

In the remaining two studies, researchers did not test specific cognitive-behavioral therapies, but in both of them, with most of the patients, if not with all of them, programs were applied that included the basic components of trauma-focused cognitive-behavioral therapy. Thus, in the study of García-Vera and Romero Colino (2004) with direct and indirect victims of the Madrid M-11 terrorist attacks, the patients

received therapies that included diaphragmatic breathing training, distraction techniques and stop-thinking, self-statement training, cognitive restructuring, and imaginal and in vivo exposure to the memories and stimuli associated with the attacks, whereas in the study of Brewin et al. (2008) with direct victims of the bombs that exploded on July 7th, 2005, in the transportation system of London, 80% of the patients received a trauma-focused cognitive-behavioral therapy that included cognitive therapy along with imaginal and in vivo exposure to the memories and stimuli related to the explosions.

In general, the results of the four studies were positive (see Table 1), with rates of clinically significant improvement for PTSD of 67% (García-Vera & Romero Colino, 2004), 73% (Gillespie et al., 2002), and 87% (Brewin et al., 2008), rates that, with the precautions due to the different definitions of improvement used, are similar to those found in the studies reviewed in the above section on the efficacy of trauma-focused cognitive-behavioral therapy (56 and 78%; see Table 1). Likewise, the therapeutic results in terms of the magnitude of the pre-posttreatment differences in the measures of posttraumatic stress symptomatology were, in general, similar to those found in the studies of efficacy (see Table 1). Strange to say, however, the rates of treatment dropout for the patients with PTSD were lower in the studies of effectiveness (4% in Brewin et al., 2008; 22% in García-Vera & Romero Colino, 2004, and 24% in Levitt et al., 2007—including 5% who refused to continue with exposure, although they remained in treatment to complete the other components of the treatment—) than in one of the efficacy studies (53% in Difede, Malta et al., 2007), and similar or also lower than in the other study (20% in Duffy et al., 2007).

Summing up, the results of the studies on the clinical effectiveness or clinical utility of trauma-focused cognitive-behavioral therapy for victims of terrorism who suffer from PTSD allow us to conclude that this therapy is not only efficacious, but it is

also clinically useful in habitual psychotherapeutic practice. These results corroborate the recommendation to use trauma-focused cognitive-behavioral therapy as the first choice for the victims of terrorism with PTSD, especially as there is no study published to date about the clinical effectiveness of other types of psychological treatment, including the treatments that have shown their efficacy and clinical effectiveness with victims of other traumatic events.

Innovative Treatments

The use of virtual reality in exposure therapy is being investigated in the treatment of victims of terrorism with PTSD (Difede & Hoffman, 2002; Josman, Somer, Reisberg, Weiss, García-Palacios, & Hoffman, 2006). In fact, a study with a group design, but non- experimental (no randomization of patients to groups) has been published that compared, in a sample of volunteers and professionals who helped to rescue the victims of the S-11 attacks and who had a diagnosis of PTSD, the efficacy of cognitive-behavioral therapy with exposure using virtual reality versus a waiting-list control group (Difede, Cukor et al., 2007). The results of this study, that are summarized in Table 1, are quite promising, as the patients who completed the cognitive-behavioral therapy with virtual reality exposure showed significantly lower levels of posttraumatic stress symptomatology at posttreatment than the waiting-list patients. In fact, considering a 10-point reduction in the CAPS as clinically significant improvement, 90% of the patients who completed the therapy showed clinically significant improvement at posttreatment and, moreover, the therapeutic benefits were maintained at the 6-month follow-up with a mean reduction of approximately 35 points in the CAPS from pretreatment to follow-up, a reduction that was statistically significant (see Table 1).

Although the conclusions that can be reached from this study should be taken with caution because of its quasi-experimental design, the small number of patients that finally completed treatment ($n = 10$), and the lack of information about the results of the group of patients who initiated therapy (not only the results of those who completed it), its results are nonetheless promising and they offer a very encouraging therapeutic alternative, especially for patients who have difficulties to engage emotionally in imaginal exposure and for whom this type of exposure may therefore not be effective. In this sense, Difede, Cukor et al. (2007) indicated that 5 of the patients who had made up the treatment group in their study, had not managed to improve previously with imaginal exposure therapy, possibly because of their difficulties to engage emotionally in the exposure, as they had reported scores of 0 in the Subjective Units of Distress Scale (SUDS) across several sessions of imaginal exposure. In contrast, after receiving the cognitive-behavioral therapy with virtual reality exposure, 3 of these patients had shown a posttreatment reduction of at least 25% in their CAPS scores with regard to their pretreatment scores, whereas the 2 remaining patients showed a reduction of more than 50%.

Treatment of Other Mental Disorders

Till now, no experimental or quasi-experimental study has been published that has tested the efficacy or clinical effectiveness of the psychological treatments applied specifically to direct or indirect victims of terrorist attacks who suffer from mental disorders other than PTSD. As commented on above, after a terrorist attack, the onset of major depressive disorder, agoraphobia, panic disorder, generalized anxiety disorder, and alcohol and substance dependence disorders is frequent, and, for all these disorders, there is currently a large number of therapies, mainly cognitive-behavioral, that have proved their efficacy and clinical effectiveness in samples of patients extracted from

hospitals, mental health centers, or primary care centers and who have not necessarily undergone either terrorist attacks or any other kind of traumatic event (NICE 2007a,b; Pérez Álvarez, Fernández Hermida, Fernández Rodríguez, & Amigo Vázquez, 2003).

There is clearly a gap in current research on the treatment of the psychopathological consequences of terrorism, because the number of people affected by mental disorders other than PTSD is quite significant. In fact, the presence of comorbidity among the victims of terrorist attacks is very frequent, particularly among the victims who seek or receive psychological aid. Especially, the simultaneous presence of PTSD and major depressive disorder or of PTSD and other anxiety disorders or alcohol or substance abuse/dependence is very frequent. Thus, for example, among the victims of terrorism with chronic PTSD of the study of Gillespie et al. (2002), 54% was found to suffer simultaneously from another Axis I clinical disorder, mainly major depressive disorder (47.3%), whereas in the study of Duffy et al. (2007), 63.8% of the patients with chronic PTSD also suffered from major depressive disorder (see Table 1).

In the current state of research, the treatment of choice that should be administered to the victims of terrorist attacks who present psychological disorders other than PTSD would be the therapy or therapies with the greatest empirical support to treat such disorders in other kinds of psychopathological populations. In fact, this is the strategy that has been followed in the studies displayed in Table 1 to address the presence of other disorders in the victims (García-Vera & Romero Colino, 2004) or the presence of comorbid disorders in victims with PTSD (Brewin et al., 2008; Duffy et al., 2007; Gillespie et al., 2002). For example, Duffy et al. (2007) used behavioral activation in the first sessions of therapy when the initial levels of depression interfered with processing the trauma (in their sample, approximately 64% of the victims

presented PTSD comorbidly with major depressive disorder), whereas García-Vera and Romero Colino (2004) applied techniques of gradual planning of activities and planning of pleasant activities to the victims who presented relevant depressive symptoms (in their sample of victims, 10% presented adaptive disorder with mixed anxiety and depressed mood, 2.5% presented adaptive disorder with depressed mood, 2.5% presented major depressive disorder, and 15% grief). All these techniques are a part of the behavioral and cognitive-behavioral therapies whose efficacy is supported by the empirical literature (NICE, 2007a; Pérez & García, 2003).

It is not possible to carry out a specific analysis of the role of these techniques in the efficacy or effectiveness of the therapies or in the differential efficacy or effectiveness in the victims who present other disorders or other disorders comorbidly with PTSD. However, the data in Table 1 allow us to conclude that the trauma-focused cognitive-behavioral therapies that, in some cases, included these antidepressive techniques had positive effects both on the victims with depressive disorders (approximately 92% of the patients with depression spectrum disorders recovered in García-Vera & Romero Colino, 2004) and on the victims who showed comorbidity (in Brewin et al., 2008, 79% of the victims improved in a clinically significant way with regard to their scores on the Beck Depression Inventory -BDI- whereas in Duffy et al., 2007, a mean pre-posttreatment reduction was reached of about one standard deviation $-ES = 1.05-$ with regard to the depressive symptomatology measured by the BDI).

In any case, the presence of other mental disorders in the victims, especially if it is comorbid, is a challenge from the therapeutic viewpoint. In the victims of terrorism with PTSD, comorbidity is usually associated with a longer duration of the trauma-focused cognitive-behavioral therapy (Duffy et al., 2007; Gillespie et al., 2002), partly

because the therapists must introduce additional techniques to address the other disorders.

In this sense, the treatment of people who have lost a loved one in the attacks deserves special mention. In these cases, to the habitual reactions after a situation of loss (i.e., certain depressive reactions) are added the symptoms of posttraumatic stress that make up a specific syndrome in which, for example, the images and memories of the deceased generate a mixture of feelings of sadness and traumatic suffering so that even the positive memories of the loved one are doubly avoided: in the first place, because they produce sadness and longing for the deceased, and secondly, because they also trigger painful and anxious memories of the loved one's traumatic and violent death. In fact, as shown in the results of Shear et al. (2006), it is likely that many of these cases fall into the category of traumatic grief proposed by Prigerson et al. (1999). This category, which replaces the one that has sometimes been called complicated or pathological grief, refers to a different disorder from PTSD, depression, or other anxiety disorders, in which, after the death of a loved one, not necessarily violent or the product of a traumatic event, there are concurrent symptoms of separation distress (e.g., yearning, searching for the deceased, excessive loneliness resulting from the loss) and symptoms of traumatic distress (i.e., intrusive thoughts about the deceased, disbelief about the loss, a sense of futility about the future, being dazed and numbness, and loss of the feeling of security and trust in others). This condition requires a specific therapeutic approach, for example, the one developed by Shear et al. (2001) that combines strategies from cognitive-behavioral therapy for PTSD and interpersonal therapy for depression. Future research should address the administration of this kind of treatment to the direct and indirect victims of terrorism who have lost loved ones in the attacks.

Lastly, a therapeutic approach that is still in the experimental phase in its administration to the victims of terrorism who present mental disorders other than PTSD is the application of cognitive-behavioral techniques via Internet, an approach that has already produced positive results in patients who suffer from depression, panic, alcohol abuse, or anxiety, or even PTSD as a result of other traumatic events (see the review of Amstadter, Broman-Fulks, Zinzowa, Ruggiero, & Cercone, 2009). Ruggiero et al. (2006) have developed an intervention program for victims of terrorism made up of seven modules targeting, respectively, the following disorders and problems: PTDS/panic, depression, generalized anxiety, alcohol abuse, marihuana abuse, abuse of other drugs, and smoking. Each one of these modules includes psychoeducation and information about coping techniques based on the cognitive-behavioral therapies whose efficacy for each one of these disorders and problems has more empirical support. Thus, for example, the module of PTSD/panic includes recommendations for exposure, reduction of avoidance behaviors, and learning control of breathing. Although no data has yet been published on the efficacy or effectiveness of this kind of intervention, there are data with a sample of 285 residents of New York after the S-11 attacks that indicate that the intervention is feasible, in terms of, for example, users' time and effort, acquisition of knowledge about PTSD, panic, and depression, or degree of satisfaction (Ruggiero et al., 2006). As Internet offers the possibility of reaching a large quantity of people quickly and cheaply, this kind of intervention, if finally efficacious, could be a therapeutic alternative to be considered both by itself and used conjointly with the traditional therapies.

Conclusions

In the last few decades, terrorism has become one of the most severe and alarming problems worldwide. In response, in the past 10-15 years, Psychology has

developed systematic research programs about the psychopathological repercussions of terrorist attacks and their treatment, although those programs have been practically limited to the massive terrorist attacks that have occurred in developed countries.

After a terrorist attack, an important percentage of the direct victims (around 20-30%) will develop PTSD and other mental disorders (depression, other anxiety disorders, alcohol and other substance abuse/dependence disorders). The number of indirect victims who will develop these disorders will be lower, but even so, it will be higher than the habitual prevalence of such disorders in the general population before the attacks. Consequently, both the direct and indirect victims will need psychological attention at the short, medium, and long term, which should be provided within a framework of a global response to terrorism, especially in the case of terrorist attacks that cause a very high number of dead and injured, as well as important material destruction. Moreover, the psychological intervention should take into account the diverse needs and characteristics of the affected and the fact that such needs have different priorities and can vary at different moments or phases after the attacks.

In the phases of this global response known as recovery and return to life, the victims who present PTSD and other mental disorders should be provided with the psychological treatments that have the greatest empirical guarantees regarding their efficacy and clinical effectiveness. Although still scarce, in recent years, some experimental and quasi-experimental group studies have been published about the efficacy and clinical effectiveness of trauma-focused cognitive-behavioral therapy for the victims of terrorism who present PTSD. This kind of therapy combines cognitive techniques with in vivo and imaginal exposure and, in some cases, also with stress control techniques. The results of these studies allow us to recommend this therapy above and beyond other therapeutic alternatives, including therapies that have proved

their efficacy and effectiveness in the treatment for PTSD derived from other traumatic events (e.g., exposure therapy alone or EMDR). Future research should precisely determine whether these other psychological treatments that have proved their efficacy with victims of other traumatic events (i.e., war veterans, victims of physical violence or rape, refugees, or traffic-accident survivors) can also be efficacious with victims of terrorism. Likewise, another challenge for psychological research in the sphere of terrorism is the development and testing of specific therapies for the other mental disorders that victims of terrorism may present because, currently, the recommendations to address them are based on the data about the efficacy and effectiveness of diverse psychological treatments when applied to other kinds of psychopathological patients, who have not necessarily suffered terrorist attacks or any other kind of traumatic event.

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Table 1. Group studies on psychological treatment of victims of terrorism

Reference	Terrorist incident	Victims	Main psychological disorders (% of victims)	Psychological treatment	Measures	Short-term results	Medium-and long-term results
Between-group design with randomized assignment to treatment (TG) and control groups (CG)							
Duffy, Gillespie & Clark (2007)	Terrorist attacks and related civil conflicts in Northern Ireland	58 victims: - 32 direct witnesses - 15 indirect witnesses - 11 injured	- PTSD: 100% - MDD: 63.8% - Panic disorder: 20.7% - Alcohol or substance use disorder: 13.8% - Specific phobias: 10.3% - GAD: 5.2%	- TG (29 patients): CBT (12 weekly sessions; mean number = 5.9) with additional follow-up sessions (mean number = 2) - CG (29 patients): wait-list for 12 weeks followed by cognitive therapy	- PDS - BDI-IA - SDS-W, SDS-S, and SDS-F	At 12 weeks, significant between-group differences on all measures, with the TG improving significantly on all measures and CG not improving on any measure. Within-group ES for all patients who received CBT (intention-to-treat $N = 58$): 1.25 (PDS), 1.05 (BDI-IA), 0.97 (SDS-W), 1.03 (SDS-S), and 0.70 (SDS-F) For all patients who received CBT (intention-to-treat $N = 59$), 56.1% improved (at least 50% reduction in PDS)	Treatment gains were well maintained: no significant differences or further significant improvements were found in scores from after treatment to follow-up (1-, 4-, or 12-month follow-up)

Reference	Terrorist incident	Victims	Main psychological disorders (% of victims)	Psychological treatment	Measures	Short-term results	Medium-and long-term results
Difede, Malta, et al. (2007)	New York September 11, 2001, World Trade Center plane crashes	31 disaster workers	- PTSD: 67.7% - Subthreshold PTSD criteria: 32.3%	- TG (15 patients; completers = 7): CBT (12 weekly sessions) - CG (16 patients; completers = 14): treatment as usual (assessment feedback and advice and help to obtain treatment for PTSD: none sought treatment)	- CAPS - PCL - BDI - BSI-GSI - MAST	At 12-weeks, no significant between-group differences on any measure for intention-to-treat sample. Significant between-group differences on CAPS and PCL for completers. Between-group ES for completers: 1.37 (CAPS) and 1.66 (PCL). For completers, 78.1% (TG) vs. 28.6% (CG) improved in CAPS	At 3-month follow-up, treatment gains seem to be well maintained on PCL, BDI, GSI and MAST for TG completers (n = 6), but clear statistical results were not reported
Between-group design with nonrandomized assignment to treatment (TG) and control groups (CG)							
Difede, Cukor, et al. (2007)	New York September 11, 2001, World Trade Center plane crashes	21 disaster workers and civilians	- PTSD: 100%	- TG (13 patients; completers = 10): CBT with virtual reality exposure (8-14 weekly sessions) - CG (8 patients): wait-list	- CAPS - PCL - BDI - BSI-GSI	At post-treatment, significant between-group differences on CAPS for completers. Between-group ES for completers: 1.54 (CAPS). For completers, 90% improved in CAPS	At 6-month follow-up, treatment gains were well maintained on CAPS for completers (n = 9), with significant within-group differences on CAP from pretreatment to follow-up

Reference	Terrorist incident	Victims	Main psychological disorders (% of victims)	Psychological treatment	Measures	Short-term results	Medium-and long-term results
Within-group design							
Gillespie et al. (2002)	Omagh bombing (Northern Ireland)	91 victims: - 33% injured - 42% direct witnesses - 12% emergency personnel - 13% other victims	- PTSD: 100% - MDD: 47.3% - Alcohol abuse or dependence: 5.5% - Panic disorder and/o agoraphobia: 4.4%	CBT (median number of sessions = 8; range: 2-73)	- PDS - RIES - BDI-IA - GHQ	At post-treatment, significant within-group differences on PDS ($n = 78$ patients), BDI ($n = 33$) and GHQ ($n = 37$). Within-group ES for PDS: 2.47 ($n = 78$ patients). For $n = 78$, 73.1% improved (at least 50% reduction in PDS)	No follow-up
García-Vera & Romero Colino (2004)	Madrid, March 11, 2004, train bombings	40 victims: - 7.5% injured - 55% relatives of dead victims - 17.5% rescue volunteers - 12.5% direct witnesses - 7.5% indirect witnesses	- PTSD: 22.5% - Acute stress disorder: 22.5% - Adjustment disorder: 37.5% - MDD: 2.5% - Grief: 15%	CBT (mean number of sessions = 5; range = 2-16)	- ESEA - EI - BDI-II - STAI	For all patients: - 5% dropouts - 90% recovered (not meeting diagnostic criteria + scores on symptom measures falling within the normal range) - 5% not recovered For patients with PTSD: - 22% dropouts - 67% recovered - 11% not recovered For patients with acute stress disorder: - 100% recovered For patients with adjustment disorders: - 100% recovered	No follow-up

Reference	Terrorist incident	Victims	Main psychological disorders (% of victims)	Psychological treatment	Measures	Short-term results	Medium-and long-term results
Levitt et al. (2007)	New York September 11, 2001, World Trade Center plane crashes	59 victims: - 83% direct witnesses - 7% injured - 10% indirect witnesses	- PTSD symptoms: 100%	CBT: 16 weekly sessions plus additional sessions until maximum of 25 (mean number of sessions = 19; range = 12-25)	- MPSS-SR - BDI - NMR - SAS-SR - BSI-H and BSI-IS - COPE-AD and COPE-SS	At post-treatment, significant within-group differences on all measures for completers ($n = 38$ patients). Within-group ES for completers: 1.79 (MPSS-SR), 1.23 (BDI), -.70 (NMR), .64 (SAS-SR), .82 (BSI-H), .67 (BSI-IS), .59 (COPE-AD), -.43 (COPE-SS)	No follow-up
Brewin et al. (2008)	London July 7, 2005, bombings	75 survivors	- DSM-IV PTSD or ICD-10 PTSD: 100%	- CBT: 80% patients - EMDR: 10% patients - CBT + EMDR: 10% patients. Modal number of sessions = 9 (range = 1-29)	- PDS - BDI	At post-treatment, significant within-group differences on all measures for intention-to-treat sample. Within-group ES for patients with DSM-IV PTSD: 2.53 (PDS) and 1.90 (BDI). Within-group ES for patients with ICD-10 PTSD: 1.99 (PDS) and 1.04 (BDI). For $n = 53$, 87% and 79% improved in PDS (score < 24) and BDI (score < 15), respectively	No follow-up

Note. Psychological disorders: GAD = Generalized anxiety disorder. MDD = Major depression disorder. PTSD = Post-traumatic stress disorder. Psychological treatments: CBT = Cognitive-behavioral treatment. EMDR = Eye movement desensitization and reprocessing. Measures: BDI, BDI-IA and BDI-II = First edition, first edition amended and second edition of the Beck Depression Inventory. BSI-H and BSI-IS = Hostility and Interpersonal sensitivity subscales of the Brief Symptom Inventory. BSI-GSI = Global severity index of the Brief Symptom Inventory. CAPS = Clinician-Administered PTSD Scale. COPE-AD and COPE-SS = Alcohol and drug use and Social support subscales of the Coping Orientation to Problems Experienced Inventory. ESEA = Scale of Acute Stress Symptoms. EI = Maladjustment Scale. GHQ = General Health

Questionnaire. MAST = Michigan Alcohol Screening Test. MPSS-SR = Modified PTSD Symptom Scale-Self-Report. NMR = General Expectancy for Negative Mood Regulation Scale. PCL = PTSD Checklist. PDS = Post-trauma Diagnosis Scale. RIES = Revised Impact of Events Scale. SAS-SR = Social Adjustment Scale Self-Report. SDS-W, SDS-S and SDS-F: Work, Social and Family subscales of the Sheehan Disability Scale. STAI = State-Trait Anxiety Inventory.
Results: ES = Effect size.