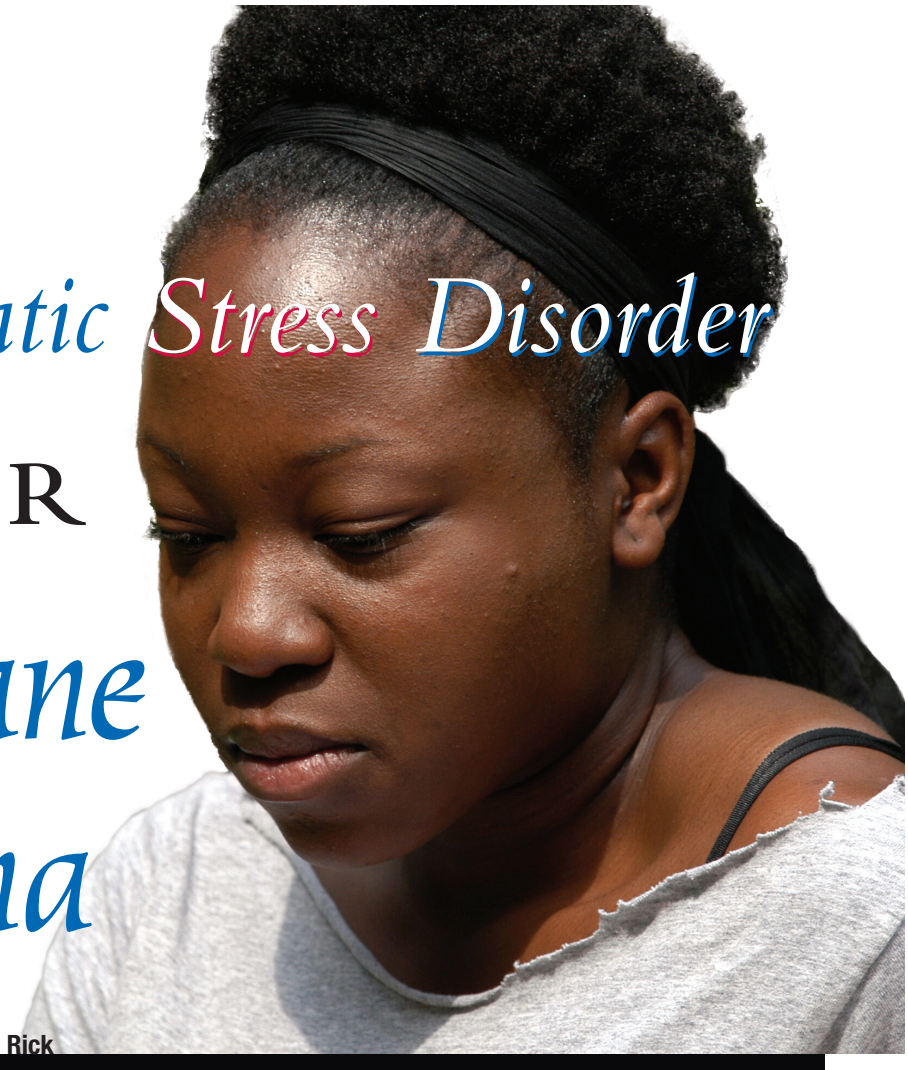
Posttraumatic Stress Disorder AFTER Hurricane Katrina



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Abstract

All who viewed the horror caused by Hurricane Katrina could see the reactions of terror, paralysis, loss, and grief. For those who lived through the event itself, these same symptoms are often continued as the survivor relives the horror over and over again. Posttraumatic stress disorder (PTSD) is a psychological and physical reaction to a stressful event that any of us might face, whether we live through it or just witness it repeatedly on television. But emotional distress differs from posttraumatic stress disorder. Why do some persons suffer more extensively? How do you tell when someone has PTSD? How can you help? The lessons learned in the aftermath of this terrible natural disaster may be applied to many other situations for patients or providers alike.

Keywords: *posttraumatic stress disorder, emotional distress, numbness*

For a week the country watched Hurricane Katrina, packing 160 mph winds, move slowly toward New Orleans with an expected landfall as a Category 4 or 5 sometime Monday morning, August 29. About 1.3 million persons live in New Orleans and its suburbs, and many began evacuating before Sunday morning; others waited to see whether the storm would turn as storms had done in the past seasons.[1] By Sunday evening, nearly 1 million persons had fled the city and its surrounding parishes. Between 20,000 and 25,000 others remained in the city and sought shelter in the Louisiana Superdome, lining up for what they thought would be an uncomfortable but bearable 2

to 4 days.[1] Approximately 20,000 stranded tourists were told to remain in the city's hotels, on third-floor levels or higher, and away from windows.[1] Any hopes of evacuation out of the city were clearly impossible.

Two days after the hurricane a reporter from Fox News correctly estimated the death toll in the thousands and the damage higher than $200 billion, topping Hurricane Andrew as the most expensive natural disaster in US history.[1] More than a million persons had been displaced—a huge humanitarian crisis unseen in the United States since the Great Depression.[1] No large American city had ever been evacuated since Richmond and Atlanta in the Civil War.[1]

STORM'S EFFECTS ON THE PEOPLE OF NEW ORLEANS

The people who directly experienced the hurricane's effects can be seriously affected by the storm's psychological effects. Many of these people have now been displaced from their homes and are being cared for in new communities. Although these people will suffer the most, some other persons who only witnessed the effects of the hurricane repeatedly on television may also be at risk of posttraumatic stress disorder (PTSD). They all may encounter behavioral and emotional readjustment problems that are normal responses to the hurricane's aftermath. Their exposure to the stress of the storm can change their focus and create confusion about what they need to do.[2] How serious these effects will be depend on such things as each person's overall ability to cope with stress, how serious the traumatic event was, and what kind of help and support he or she gets from family, friends, and professionals following the trauma.[2]

Most survivors will think the feelings they have are indications they are having a nervous breakdown or that there is something wrong with them because other persons who experienced the same trauma do not appear to be experiencing the same feelings. Some may turn to drugs or alcohol to make them feel or rest better. Others may turn away from friends and family who do not seem to be as affected or understand what they are feeling.[2]

The Katrina survivors from New Orleans faced not only the danger of death and physical injury but also the loss of their homes, possessions, and communities. Many were separated from their families and were moved to shelters far away from the life that was familiar.

Even before the hurricane, New Orleans was recorded in the *Louisiana Health Care Report Card* as a city with many poor, impoverished persons. Many environmental, social, and economic factors contribute to the ranking of New Orleans and the State of Louisiana at the top of the charts of poor health outcomes.[3] The median family income for New Orleans residents is $22,276.[3] Approximately 34% of family households are at or below the poverty level.[3] In the entire state, one in three children lives in poverty.[3] In New Orleans, that number changes to about one in two.[3] Ninety-seven percent of Louisiana parishes are designated as either totally or partially medically underserved.[3]

Hurricane Katrina only added to the stress of the poor, for they were the ones most affected. They were the ones stranded on the overpasses, roofs, and in the Superdome and Convention Center without food or water. They were the ones who became overwhelmed with fear and a sense of hopelessness.

Unfortunately, these also are the persons who most likely will mentally and physically reexperience the trauma. These feelings make them more susceptible to PTSD.[2]

POSTTRAUMATIC STRESS DISORDER

PTSD is different from most mental health diagnoses in that it is tied to a particular traumatic life experience that typically involves the potential for death or serious injury.[4] Several types of experiences and the percentage of survivors who develop PTSD are listed in Table 1. These experiences result in intense fear, helplessness, or horror. It is reasonable to expect that many of those most affected by Hurricane Katrina will have one or more of the common stress reactions for several days and possibly weeks (Box 1).[2,5] Patients may experience temporary psychological reactions, cognitive reactions, physical complaints, or changes in psychosocial behavior that cause them to avoid large crowds or social activities at which they may be asked about the event.[4] Work is often impaired or the person calls in sick to avoid any chances for recall.[4]

Most who were affected by Hurricane Katrina will most likely experience only mild, normal stress reactions. The literature[2,4-6] documents that in many instances disaster experiences can promote personal growth and strengthen relationships. However, one of every three persons who experienced this disaster will

Table 1. Percentage of Persons Experiencing Disasters Who Are Diagnosed With PTSD[2,4]

Event	Percentage
Bombing	34
Mass shooting	33
Plane crash	29
Violent assault	19
Motor vehicle accident	14
Assault, burn, industrial accident	13
Natural disaster	4-5

have symptoms that are more than the normal stress reactions—what is called PTSD.[4]

WHO IS AT RISK

By just watching the television the first few days after Hurricane Katrina, it is evident that the experiences of New Orleans residents place them at a higher than normal risk of severe stress symptoms and lasting PTSD. Other persons who watched the event repeatedly on television also feel a sense of hopelessness, shock and despair. This is especially true if they have had a history

Box 1. Common Symptoms of Reactions to Traumatic Stress

Emotional Reactions
- Shock
- Terror
- Irritability
- Blame
- Anger
- Guilt
- Grief or sadness
- Emotional numbing
- Helplessness
- Loss of pleasure derived from familiar activities
- Difficulty feeling happy
- Difficulty experiencing loving feelings

Cognitive Reactions
- Impaired concentration
- Impaired decision-making ability
- Memory impairment
- Disbelief
- Confusion
- Nightmares
- Decreased self-esteem
- Decreased self-efficacy
- Self-blame
- Intrusive thoughts or memories
- Worry
- Dissociation (eg, tunnel vision, dreamlike or "spacey" feeling)

Physical Reactions
- Fatigue, exhaustion
- Insomnia
- Cardiovascular strain
- Startle response
- Hyperarousal
- Increased physical pain
- Reduced immune response
- Headaches
- Gastrointestinal upset
- Decreased appetite
- Decreased libido
- Vulnerability to illness

Psychosocial Reactions
- Increased relational conflict
- Social withdrawal
- Reduced relational intimacy
- Alienation
- Impaired work or school performance
- Decreased satisfaction
- Distrust
- Externalization of blame
- Externalization of vulnerability
- Feeling abandoned/rejected
- Overprotectiveness

Note: Modified from the *Disaster Mental Health Response Handbook*[2] and Young et al.[5]

of exposure to other traumas (such as severe accidents, abuse, assault, combat, rescue work); chronic medical illness or psychological disorders; chronic poverty, homelessness, unemployment, or discrimination; recent or subsequent major life stressors or emotional strain (such as single parenting), which many did.[6] It will bring back memories of other times or other traumas that will intensify current problems, including magnitude, duration, and type of traumatic exposure. Variables such as age when exposed to the trauma and a lower level of education are also associated with increased risk of developing PTSD.[7]

Additional factors related to vulnerability for developing PTSD include severity of initial reaction; peritraumatic dissociation (ie, feeling numb and having a sense of unreality during and shortly after a trauma); early conduct problems; childhood adversity; family history of psychiatric disorder; poor social support after a trauma; and personality traits such as hypersensitivity, pessimism, and negative reactions to stressors.[7] Women are more likely to develop PTSD than men, independent of exposure type and level of stressor, and a history of depression in women increases the vulnerability for developing PTSD.[7]

Although exposure to a traumatic event may result in an increased vulnerability to subsequent traumas, several studies have also reported that exposure to trauma can have an inoculation effect and strengthen a person's protective factors.[4] This occurs when a person has experience in successfully mastering traumatic events.[7]

School-aged children show greater psychological impairment after disasters than do adults.[7] A longitudinal study of young children and adolescents exposed to Hurricane Andrew found that younger children are at greater risk of PTSD than older adults. Studies of the effects after Hurricane Hugo showed that age interacted with most stressors (eg, life threat, injury, loss).[7,8,9] Middle-aged persons experienced the highest levels of disaster-related symptoms of depression, anxiety, and posttraumatic stress. A study of firefighters by Ursano et al[10] showed that psychosocial resources, such as hardiness, perceived control, and social support, afford critical protection for disaster victims.[10]

Several factors can aggravate stress reactions and increase the risk of developing negative outcomes.[4] These factors include lack of support before and after the disaster, poor coping strategies before the event, bad experiences at the scene of the disaster, lack of information about the disaster, and impersonal attention to the victims[4] (Table 2).

PHASES OF PTSD

Published studies[4,7,8,9,10,12] have identified the following phases of PTSD:

- Phase 1: Impact
- Phase 2: Postdisaster: recoil and rescue
- Phase 3: Recovery
- Phase 4: Problematic stress response

Each phase has significant signs and symptoms that assist the health care provider in diagnosing the disorder.[4,7-10,12]

Phase 1: Impact

Most persons respond appropriately during the impact of a disaster and react to protect their own lives and the lives of others. This is a natural and basic reaction.[11] They may cry, panic, or run away, and these behaviors need to be addressed in the postdisaster period.[4] After the fact, persons may judge their actions during the disaster as inappropriate or foolish or not having fulfilled their own or others' expectations.[4] They may be disorganized and in shock and may not be able to respond appropriately to protect themselves. Such fragmented behavior may be short lived or last indefinitely.[4]

The person may experience several events that may compound the traumatic event. For example, threat to life and encounters with death; feelings of helplessness and powerlessness; loss (eg, loved ones, home, possessions), dislocation (ie, separation from loved ones, home, familiar settings, neighborhood, community); feeling responsible (eg, feeling as though more could have been done); inescapable horror (eg, being trapped or tortured); and human malevolence. (It is particularly difficult to cope with a disaster if it is seen as the result of deliberate human actions.[4])

Phase 2: Immediate Postdisaster: Recoil and Rescue

During this phase, witnesses recoil from the impact, and the initial rescue activities commence.[4] Initial mental effects may appear (eg, persons show confusion, are stunned, or show levels of high anxiety).[4] Emotional reactions will depend on how the person responds to those events. The emotional reactions may include numbness, denial or shock, flashbacks and nightmares, grief reactions to loss, anger, despair, sadness, or hopeless-

Table 2. Factors That Affect Risk of PTSD[2]

Factors That Increase Chance of PTSD	Factors That Decrease Chance of PTSD
Specific	
Lack of emotional and social support	Social support
Presence of other stressors such as fatigue, cold, hunger, fear, uncertainty, loss, dislocation, and other psychologically stressful experiences	Higher income and education
Difficulties at the scene	Successful mastery of past disasters and traumatic events
Lack of information about the nature and reasons for the event	Limit exposure to any stressor that may precipitate PTSD
Lack of or interference with self-determination and self-management	Provision of information about expectations and availability of recovery services
Treatment [given] in an authoritarian or impersonal manner	Care, concern, and understanding on the part of the recovery services personnel
Lack of follow-up support in the weeks after the exposure	Provision of regular and appropriate information about the emergency and reasons for action
General	
Female sex	
Age of 40 to 60 years	
Little previous experience or training relevant to coping with disaster	
Ethnic minority	
Low socioeconomic status	
Children present in the home	
For women, the presence of a spouse, especially if he is significantly distressed	
Psychiatric history	
Severe exposure to the disaster, especially injury, life threat, and extreme loss	
Living in a highly disrupted or traumatized community	
Secondary stress and resource loss	

ness.[4] In this phase relief and survival may lead to feelings of joy, which may be difficult to accept in the face of the destruction the disaster has wrought. These feelings of joy may make the person feel guilty or shameful that he or she survived or were able to escape without problems (survivor's guilt).[4]

Phase 3: Recovery

The recovery phase is the prolonged period of adjustment or return to normalcy that everyone must go through.[4] It begins when rescue is completed and persons face the task of getting their lives and activities back to normal. Much of what happens during this phase depends on the extent of devastation that has occurred, as well as injuries and lives lost.[4]

During this phase, the person receives the aid that usually comes after disaster. The disillusionment phase sets in when the disaster is no longer on the front pages of newspapers and attention is gone.[4] Then the person becomes withdrawn, and the realities of loss, bureaucratic constraints, and the changes caused by the disaster become evident, and, in many cases, overwhelming.[4]

During acute danger the person's priority is basic safety and survival. Once this is secured, other needs emerge that are physical, social, and psychological. These needs are typically left frustrated and unfulfilled for a prolonged period. This frustration may result in feelings of retribution or violence that place the person or others in the community in greater jeopardy for PTSD.[4]

Emotional needs are very important, especially for those who have been severely affected, and may only start to appear during this phase. Persons may also be hesitant to express their needs, feeling they should be grateful for the aid given or because they have suffered less than others have. Note that sometimes these emotional reactions may present as physical health symptoms, such as sleep disturbance, indigestion, and fatigue, or they may present as social distress, such as relationship or work difficulties.[4]

However, some persons during this phase also show resilience, relief, and elation at surviving disaster; a sense of excitement and a feeling of greater self-worth; changes in the way they view the future; and feelings of "learning about one's strengths" and growing from the experience.[4]

Phase 4: Problematic Stress Responses

In the fourth phase responses that are less common are seen and indicate that the person will likely need assistance from a medical or mental health care provider.[4] These responses include the following:

- Severe dissociation (feeling as if the world is unreal, not feeling connected to own body, losing sense of identity or taking on a new identity, amnesia)[4]
- Severe intrusive reexperiencing (flashbacks, terrifying screen memories or nightmares, repetitive automatic reenactment)[4]
- Extreme avoidance (agoraphobic-like social or vocational withdrawal, compulsive avoidance)[4]
- Severe hyperarousal (panic episodes, terrifying nightmares, difficulty controlling violent impulses, inability to concentrate)[4]
- Debilitating anxiety (ruminative worry, severe phobias, unshakable obsessions, paralyzing nervousness, fear of losing control or going crazy)[4]
- Severe depression (lack of pleasure in life, feelings of worthlessness, self-blame, dependency, early awakenings)[4]
- Problematic substance use (abuse or dependency, self-medication)[4]
- Psychotic symptoms (delusions, hallucinations, bizarre thoughts or images)[4]

Some persons will be more affected by a traumatic event for a longer period than others, depending on the nature of the event and the physical and mental condition of the person who experienced it. It is during this phase that PTSD is often diagnosed, with severity depending on how vulnerable the person is, how well he or she copes with stress, and the degree of exposure to the disaster.[4]

PATHOLOGY OF PTSD

PTSD is marked by clear biological changes and psychological symptoms and is complicated because it frequently occurs in conjunction with related disorders such as depression, substance abuse, problems of memory and cognition, and other problems of physical and mental health.[4] The disorder is also associated with an impaired ability to function in social or family life, leading to occupational instability, marital problems and divorces, family discord, and difficulties in parenting. Common traumatic stress reactions are listed in Box 1.[2,5]

Stable neurobiological alterations in both the central and autonomic nervous systems, such as altered brain wave activity, decreased volume of the hippocampus, and abnormal activation of the amygdala, are seen in those with PTSD.[4] Both the hippocampus and the amygdala are involved in the processing and integration of memory. The amygdala is involved in coordinating the body's fear response.[4] Psychophysiological alterations associated with PTSD include hyperarousal of the sympathetic nervous system, increased sensitivity of the startle reflex, and sleep abnormalities.[4]

Persons with PTSD tend to have abnormal levels of key hormones involved in the response to stress.[4] Increased thyroid function seems to be present with PTSD. Some studies have shown that cortisol levels in those with PTSD are lower than normal, and epinephrine and norepinephrine levels are higher than normal.[4] Persons with PTSD also continue to produce higher than normal levels of natural opiates after the trauma has passed.[4] An important finding is that the neurohormonal changes seen in PTSD are distinct from, and actually opposite to, those seen in major depression.[4]

PTSD is associated with the increased likelihood of co-occurring psychiatric disorders. In a large-scale study,[4] 88% of men and 79% of women with PTSD met criteria for another psychiatric disorder. The co-

occurring disorders most prevalent for men with PTSD were alcohol abuse or dependence (51.9%), major depressive episodes (47.9%), conduct disorders (43.3%), and drug abuse and dependence (34.5%). The disorders most frequently comorbid with PTSD among women were major depressive disorders (48.5%), simple phobias (29%), social phobias (28.4%), and alcohol abuse or dependence (27.9%).[4] PTSD also significantly affects psychosocial functioning, independent of comorbid conditions, and includes problems in family and other interpersonal relationships, with employment, and involvement with the criminal justice system.[4]

Headaches, gastrointestinal complaints, immune system problems, dizziness, chest pain, and discomfort in other parts of the body are common in persons with PTSD. Often, medical doctors treat the symptoms without being aware that they stem from PTSD.[13]

DIAGNOSING PTSD

Unlike the common and milder response to trauma that anyone might experience, the criteria in the *Diagnostic and Statistical Manual of Mental Disorders (DM-IV-TR)*[11] for PTSD are long and complex (Box 2). The symptoms are divided into six criteria groups, and persons must display symptoms within each criterion. Diagnostic assessment of PTSD involves careful assessment of symptoms and relation to criterion; persons first describe experiencing a trauma (criterion A1) and then report whether their reactions are of fear, helplessness, or horror (criterion A2).[11] If either part of criterion A is not met, the diagnosis of PTSD cannot be made; therefore, asking persons about criteria B (five reexperiencing symptoms), C (seven avoidance symptoms), D (five arousal symptoms), E, and F is not indicated. But if criterion A is identified, the other criteria should be examined.[11]

Criterion A: The Experience

With criterion A, a person has been exposed to a catastrophic event involving actual or threatened death or injury, or a threat to the physical integrity of him/herself or others. During this traumatic exposure, the survivors will experience intense fear, helplessness, or horror.

Criterion B: The Traumatic Event Is Persistently Reexperienced

Criterion B includes symptoms that are easily identified symptoms of PTSD: the traumatic event remains, sometimes for decades or a lifetime, a dominating factor in the persons psychological status with the ability to cause panic, terror, dread, grief, or despair whenever the person is reexposed to trauma-related stimuli. These emotions manifest in daytime fantasies, traumatic nightmares, and flashbacks. Flashbacks evoke mental images, emotional responses, and psychological reactions associated with the trauma. Some severely traumatized individuals may dissociate during a stressor or have a blunted response due to defensive avoidance and numbing. Often, the intense emotional response to the stressor may not occur until considerable time has elapsed after the incident has terminated.

Box 2. PTSD Symptoms

1. Exposure to an event that threatened life of self or others
2. Event was reexperienced through nightmares, flashbacks, or recurring memories
3. Individual avoids anything that might trigger memory of the trauma
   - Drugs, ETOH
   - Decreased memory
   - Flat affect
4. Individual has symptoms of hyperactive states:
   - Insomnia
   - Anger—outbursts
   - Difficulty concentrating

Criterion C: Persistent Avoidance of Stimuli Associated With the Trauma and Numbing of General Responsiveness

This criterion consists of symptoms that reflect behavioral, cognitive, or emotional responses PTSD patients use in an attempt to reduce the chances that they will be exposed to anything that resembles the trauma-related stimuli. They will attempt to minimize the intensity of their psychological response by avoiding any situation in which they perceive a risk of confronting trauma-related stimuli. This may involve individuals cutting off the conscious experience of trauma-based memories and feel-

ings. Individuals may also have diminished interest in once significant activities and may have a sense of a foreshortened future. Finally, because individuals with PTSD cannot tolerate strong emotions, especially those associated with the traumatic experience, they separate the cognitive from the emotional aspects of psychological experience and perceive only the former. Such "psychic numbing" is an emotional anesthesia that makes it extremely difficult for people with PTSD to participate in meaningful interpersonal relationships.

Criterion D: Persistent Symptoms of Increased Arousal (not present before the trauma)

Symptoms included in Criterion D most closely resemble those seen in panic and generalized anxiety disorders. While symptoms such as insomnia and irritability are generic anxiety symptoms, hyper-vigilance and startle are more characteristic of PTSD. The hyper-vigilance in PTSD may sometimes become so intense it may appear like paranoia. This hyper-vigilance response can actually be the most significant PTSD symptom. These individuals also have difficulty concentrating.

Criterion E

The duration of the disturbance (symptoms in criteria B, C, and D) is more than 1 month.

Criterion F: Functional Ability

Criterion F, or functional ability, specifies that the survivor must experience significant social, occupational, or other distress as a result of these symptoms. This means that the symptoms must endure for more than 1 month. They must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

A diagnosis of acute PTSD will involve the presence of symptoms for less than 3 months. If symptoms persist for 3 months or more a chronic PTSD diagnosis is noted. Delayed onset of PTSD occurs when the symptoms occur at least 6 months after the stressor.

TREATMENT

The most common therapeutic protocol for patients with PTSD was published in the comprehensive book on PTSD treatment by Foa, Keane, and Friedman.[15] The protocol includes cognitive-behavioral therapy (CBT) and medication. Excellent results have been obtained with some CBT combinations of exposure therapy and cognitive restructuring, especially with female victims of childhood or adult sexual trauma.[14] Sertraline (Zoloft) and paroxetine (Paxil) are selective serotonin reuptake inhibitors (SSRIs) that are the first medications to receive approval by the Food and Drug Administration as indicated treatments for PTSD. Success was reported with eye movement desensitization and reprocessing (EMDR), although rigorous scientific data are lacking, and it is unclear whether this approach is as effective as CBT.[15]

Perhaps the best therapeutic option for mildly to moderately affected patients with PTSD is group therapy. In such a setting, the patient with PTSD can discuss traumatic memories, symptoms, and functional deficits with others who have had similar experiences. This approach was most successful with war veterans, rape or incest victims, and survivors of natural disaster.[14] It is important that therapeutic goals be realistic because, in some cases, PTSD is a chronic and severely debilitating psychiatric disorder that is refractory to current available treatments. The hope remains, however, that growing knowledge about PTSD will enable the design of interventions that are more effective for all patients with this disorder.[14]

Currently, there is controversy about which interventions work best during the immediate aftermath of a trauma. Research on critical incident stress debriefing (CISD), an intervention used widely, has brought disappointing results with respect to its efficacy to attenuate posttraumatic distress or to forestall the later development of PTSD. Promising results have been shown with brief CBT.[15]

Families are extremely important systems, and it is most important that postdisaster treatment and intervention efforts be aimed at the family unit. Outreach efforts for intensive services should focus on areas where at-risk persons and families are most likely to live. Treatments and interventions known to be effective for them should be implemented. It is important to provide support also to the families, especially wives and mothers, of persons with PTSD.[15]

CONCLUSION

Traumas happen to many competent, healthy, strong, good persons. No one can completely protect himself or herself from traumatic experiences. Up to 8% of persons will have PTSD at some time in their lives, and most likely everyone would develop PTSD if they were exposed to trauma that was severe enough.

Because trauma is common, it is important that practitioners consider PTSD in their differential when seeing patients. Prompt recognition of PTSD, the pathology, signs, and symptoms is important and enables quick action to prevent serious sequela that can disrupt and even end a person's life.

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