

# Chronic Pain and PTSD: Evolving Views on Their Comorbidity

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**PURPOSE:** This paper presents a literature review of post-traumatic stress disorder (PTSD) and its link to chronic pain.

**DESIGN AND METHODS:** Twenty-four papers are reviewed (included research and reviews), with the goal of improving and updating our understanding on this issue and its theoretical and clinical repercussions.

**FINDINGS:** The tight interdependence of symptoms that can be observed in both PTSD and chronic pain syndromes lends support to the idea that these disorders both constitute a reactive disorder.

**PRACTICE IMPLICATIONS:** Various forms of therapy and treatment focus on PTSD, but chronic pain symptoms must also be assessed.

Over 50 years ago, Beecher (1959) paved the way toward a new understanding of pain by putting an end to the mind-body dichotomy and adopting a biopsychosocial view of pain. Today, pain is understood in terms of four basic components: sensory, cognitive, behavioral, and emotional. The complexity of pain treatment lies in the need to take a global approach to the individual and his/her pathology and to call upon pluridisciplinary practices in considering post-traumatic stress disorder (PTSD) and chronic pain as reactive disorders.

The International Association for the Study of Pain (IASP) defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (Merskey & Bogduk, 1994). Pain that persists beyond 3–6 months and does not respond to standard treatment is called chronic.

Along with theoretical and scientific advancements in treating and understanding pain, the field of trauma has seen an upsurge of interest within the scientific and clinical community. The term “war neurosis” (also called shell shock) has been supplanted by “post-traumatic stress disorder,” the name generally used today. On the basis of DSM-IV-R criteria, published by the American Psychiatric Association (2000), this syndrome belongs to the set of anxiety disorders. It is characterized by specific symptoms that appear following

a traumatic event in which the subject comes face-to-face with death. Intrusive memories and reviviscence appear, associated with avoidance, dulled emotions, and neurovegetative hyperactivity. The symptoms must last longer than a month following the event, and must significantly alter the individual's social activity. The domain of psychotrauma has been expanded to include other stressful life experiences such as chronic illness, mourning, microtrauma, and pain. An interesting clinical case published by Grande, Loeser, Ozuna, Ashleigh, and Samii (2004) showed how pain exacerbation and PTSD can be intermingled. Whalley, Farmer, and Brewin (2007) reported another case where flashbacks of the trauma caused the person to experience pain.

Two pioneering articles have provided the guidelines for future studies (Asmundson, Coons, Taylor, & Klatz, 2002; Sharp & Harvey, 2001). In their 2001 review, Sharp and Harvey were the first to examine publications pertaining to the comorbidity of PTSD and chronic pain, noticing a real lack of research in this area. In terms of prevalence, they noted the presence of chronic pain in 20–80% of trauma cases, and PTSD in 10–50% of chronic pain cases. These initial results thus supplied some preliminary evidence of a comorbidity link between the two syndromes.

Based on these findings, Sharp and Harvey proposed a series of seven processes likely to account for the mutual

maintenance of PTSD and chronic pain. The first is “attentional biases,” where painful sensations remind the patient of the trauma on a recurring basis. The second, “anxiety sensitivity,” is seen as being capable of sustaining PTSD/chronic pain comorbidity through the interpretation of sensations. In other words, PTSD-linked anxiety contributes to maintaining the individual’s beliefs that the pain is harmful, thereby worrying the sufferer even more. The third process concerns “persistent reminders of the trauma.” Here, chronic pain is seen as a reviviscence of the trauma (as in flashbacks), which sustains the connection between the physical sensation and the trauma. The fourth process, “avoidant coping style” or escape coping, has to do not only with the chronic pain sufferer’s inability to carry out certain physical activities, which triggers a deconditioning process, but also the avoidance behavior characteristic of PTSD. “Depression and reduced levels of behavioral activity” is the fifth mutual-maintenance factor responsible for sustaining incapacitation on the chronic pain side and trauma avoidance on the PTSD side. In sixth position, we find “pain perception,” which is intensified by anxiety and increases the patient’s level of perceived pain, emotional distress, and disability. Lastly, because the “cognitive resources” needed to manage chronic pain and PTSD are depleted, there are few capacities left for developing more adaptive strategies. All of these factors point out the highly interdependent nature of PTSD and chronic pain, each syndrome contributing to maintaining or even aggravating the symptoms of the other (Sharp & Harvey, 2001, pp. 862–863).

Similarly, Asmundson et al. (2002) published a review a year later and proposed a model for understanding the PTSD/pain link based on vulnerability and the role of anxiety. In the model, anxiety sensitivity increases the individual’s alertness during the stressful event. This, in turn, makes the person even more predisposed to developing PTSD by way of awareness of the threat—and also the risk—of chronic pain due to bodily injury. However, unlike Sharp and Harvey, who regard anxiety sensitivity as a factor that maintains the PTSD/chronic pain association, Asmundson et al. see it as a predisposition to the onset of the two syndromes and their comorbidity. Making the distinction between “etiological vulnerability” and “maintenance factor” is nonetheless fundamental.

Is the link between PTSD and pain the result of a comorbidity, a cause-and-effect relation, or aggravation factors? Is pain a forgotten symptom in the nosology of PTSD? According to Sharp and Harvey (2001), it is a comorbidity relation, with chronic pain and PTSD being mutually maintained by various factors including pathologies like depression and anxiety. Should these pathologies be considered as maintenance factors, as the authors suggest, or are they comorbid disorders too? For Asmundson et al. (2002), it is more a problem of developing a description of an

etiological vulnerability that can explain the onset and comorbidity of chronic pain and PTSD. But even this would not explain why the two disorders develop in parallel, not how they are mutually maintained.

The research conducted in the years that followed furthered these early models (Beck & Clapp, 2011), but the question of the link remains a predominant one. Globally, we can subdivide the studies into several categories: some tend to see a comorbidity link between diagnoses of PTSD and chronic pain; others look for mediators—such as anxiety or depression—likely to account for the persistence of this comorbidity. Still others focus on the complex etiology between trauma and certain painful pathologies such as fibromyalgia.

## Aims and Methods

In this paper, comorbidity of chronic pain and PTSD was analyzed by reviewing the studies published following Sharp and Harvey (2001) and Asmundson et al.’s (2002) original work. Beyond a comorbidity link, are these two syndromes interwoven in a way that is more complex than mere symptom cohabitation? The etiology of the traumatic experience seems to provide a fruitful avenue of research where pain appears as a reactive manifestation that is PTSD-like but lies at the somatic level.

Papers were selected through the following process. Only studies (included research, reviews, and case studies) published between 2000 and 2013 were considered for review given advancements made around the theories proposed by Sharp and Harvey (2001) and Asmundson et al. (2002). The databases PsycINFO, PubMed, and ScienceDirect were queried using the keywords “chronic pain” and “PTSD.” This first query yielded 960 articles (Figure 1).

Only the adult population was included. The focus on persistent pain called “chronic,” without a direct link to a physical deterioration, suggests the need to seek a psychological understanding of the problem. Accordingly, papers referring to physical illnesses with a large impact on the experience of pain were excluded. Papers about acute pain were eliminated if they involved a chronic illness or palliative treatment. Furthermore, eliminated papers were dealing with PTSD and chronic pain accompanied by other symptoms, without an identified link mentioned (other than the presence of or an increase or decrease in symptoms). Although very useful in other cases, these papers were not helpful in addressing the question of comorbidity between these two syndromes.

Table 1 gives the results of the analysis according to retained criteria. Studies were heterogeneous as to the populations, type of pain, type of trauma, and sample size. However, all of them attempted to gain insight into the comorbidity link between chronic pain and PTSD from one

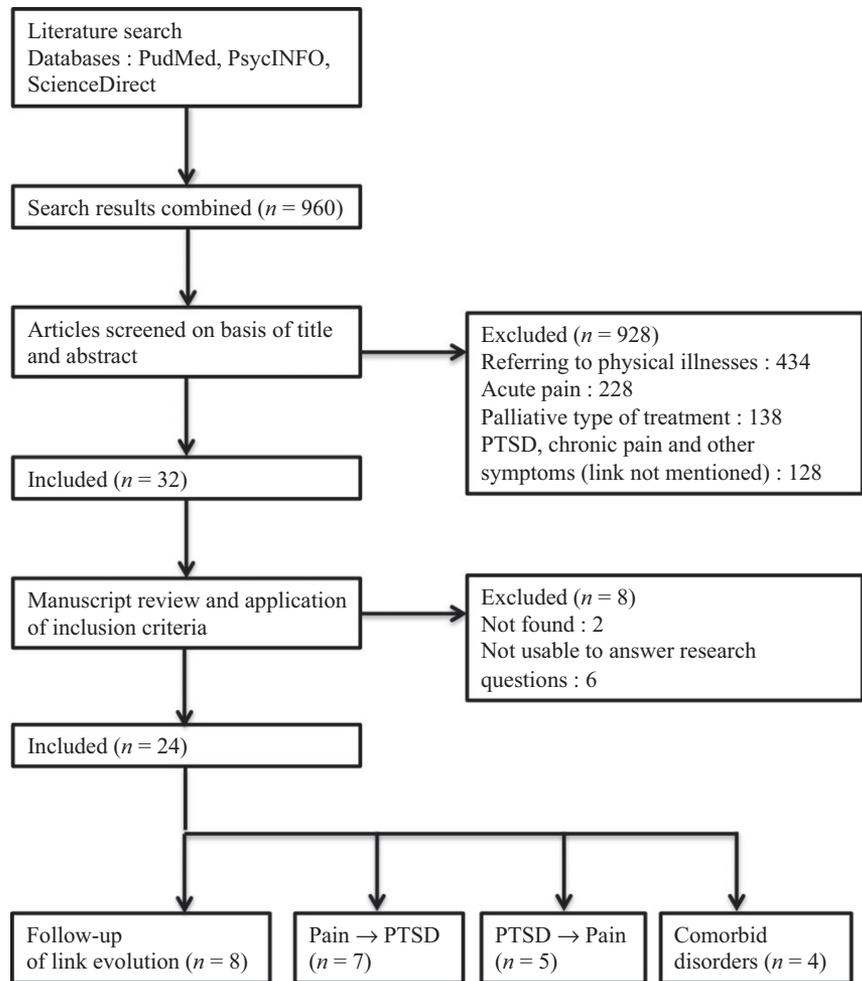


Figure 1. Literature Selection

of three perspectives: pain as a cause of the development of PTSD, PTSD as a cause of the development of chronic pain, and various comorbidities linked to the maintenance of chronic pain and PTSD.

A total of 24 research papers comprised the review. All proposed a particular understanding of the link between chronic pain and PTSD. Table 2 was organized around five criteria for analysis: source (authors' names, publication date and journal, discipline or department, and country), study aims, topic addressed, sample, and methodology and results.

## Results

The first step in the analysis was to develop an overview of current views on the link between chronic pain and PTSD, reviewing prevalence and measurement tools. Differing points of view and contrasting explanatory theories were evaluated. Is pain an aggravation factor or cause of the onset of PTSD, or is it the onset of PTSD that causes the painful syndrome to become chronic? Finally, how do secondary

disorders like anxiety and depression maintain the comorbidity of chronic pain and PTSD?

## Chronic Pain and PTSD: Prevalence and Measures

Recent epidemiological studies offer some new information about the prevalence of comorbid chronic pain and PTSD. The National Comorbidity Replication Survey reported that 7.3% of individuals with chronic lower back pain meet the criteria for PTSD (VonKorff et al., 2005). Similarly, the Canadian Community Health Survey noted a 7.7% prevalence rate of PTSD among fibromyalgia patients, and a rate as high as 46% among persons with chronic lower back pain (Sareen et al., 2007). Shipherd et al. (2007) found a chronic pain prevalence rate of 66% (including lower back pain and osteoarthritis) among veterans suffering from PTSD. Other studies have looked at the percentage of chronic pain sufferers (especially fibromyalgia) among PTSD patients; in a study by Amital et al. (2006) on men, fibromyalgia was found in 45% of the PTSD patients, 5% of the depression patients, and 0% of the controls.

Characteristics	Breakdown of characteristics	Number of articles selected
Types of pain	All types of pain	16
	Fibromyalgia	4
	Diffuse pain	2
	Lower back pain	3
	Osteoarthritis	1
	Burns	1
Trauma	All types of PTSD	11
	War	4
	Road accidents	4
	Childhood abuse	4
	Burns	1
Topic of study	Follow-up of link evolution	9
	Pain → PTSD	7
	PTSD → pain	5
	Comorbid disorders	4
Population	Persons who had a road accident	4
	Veterans	4
	Fibromyalgia patients	3
	General population	4
	Chronic pain sufferers	4
	Persons who suffered from childhood violence	3
	Anxiety-depression patients	2
	Persons who had burns	1
	Twins	1
Sample size	Less than 50	1
	50–99	5
	100–149	4
	150–499	2
	500–999	1
	1,000–1,999	4
	2,000–3,000	1
	5,000–10,000	2
	Over 10,000	1
	Over 35,000	1
Discipline or department	Psychology	5
	Psychiatry and human behavior	10
	Physical medicine and rehabilitation	1
	Veterans department	1
	Physiotherapy department	2
	Research department	2
Country	Health	2
	Australia	2
	Canada	3
	United States	14
	Israel	2
	Netherlands	2
	Switzerland	1

PTSD, post-traumatic stress disorder.

**Table 1.** Main Characteristics of the Chronic Pain/Trauma Comorbidity Studies Selected

To date, no questionnaires have been developed to directly measure the link between PTSD and chronic pain, not even ones that measure their respective symptoms on the same scale. Coffey, Gudmundsdottir, Beck, Palyo, and Miller (2006) conducted an empirical study to explore this question. For a group of 229 survivors of road accidents, the Impact

Event Scale and the PTSD Symptom Scale-Self-Report proved to be good indicators of the impact of traumatic events on chronic pain sufferers. Likewise, Poundja, Fikretoglu, Guay, and Brunet (2007) showed that the Brief Pain Inventory turned out to be a valid inventory for measuring pain among veterans who had a traumatic war event.

**Table 2.** Overview of Studies and Methodological Details

Authors	Study aims	Sample and methodology
Amital et al. (2006)	Explore comorbidity of PTSD and fibromyalgia	Sample: 124 men: 55 with PTSD, 20 with major depression, and 49 controls Tools: SHQ, Sheehan Disability Scale, SF-36 (quality of life assessment), CAPS, HDRS, FMS tenderness assessment
Arguelles et al. (2006)	Explore the role of genetic factors in comorbidity of PTSD and diffuse pain	Sample: 1,024 monozygotic twins, 828 dizygotic twins Tools: IES and CWP
Clapp et al. (2008)	Explore effects of chronic pain and PTSD comorbidity on quality of life	Sample: 142 survivors of road accidents suffering from PTSD and chronic pain Tools: WHYMPI, PSS-SR, QOLI
Coffey et al. (2006)	Comparison of two PTSD assessment scales: IES and PSS-SR	Sample: 229 survivors of road accidents, 43% of whom met PTSD criteria Tools: IES and PSS-SR questionnaires
Defrin et al. (2008)	Explore perception of pain among subjects suffering from PTSD	Sample: 32 PTSD patients, 29 patients suffering from anxiety disorder, 20 controls Tools: Diagnosis with DSM-IV-R, and scale from 0 to 10 assessing perception of pain from stimuli
Gerrits et al. (2012)	Longitudinal study on the impact of pain among patients suffering from anxiety-depression disorders	Sample: 1,209 participants with anxiety disorders and/or depression followed up for 2 years Tools: Chronic Pain Grade for pain, and CIDI for anxiety-depression disorders
Haviland et al. (2010)	Explore the relationships between major life events, traumatic experiences, and fibromyalgia diagnosis	Sample: 10,424 respondents (two-thirds women and one-third men) Tools: Questionnaire on fibromyalgia symptoms, and presence of various types of stressors or traumatic experiences
Jakupcak et al. (2006)	Determine the link between anxiety sensitivity and depression in order to understand somatic complaints of veterans suffering from PTSD	Sample: 45 veterans suffering from PTSD Tools: Self-reported ratings of anxiety sensitivity and depression
Jenewein et al. (2009)	Longitudinal study on the onset of chronic pain and comorbid disorders following road accidents involving severe injuries	Sample: 90 individuals seriously injured in a road accident, 1-, 6-, 12-, and 36-month follow-ups Tools: CAPS for PTSD, SCL-90-R for psychological complaints, HAD, SOC for resilience and coping skills
Lee (2010)	Explore the link between childhood abuse, neuroendocrine development and differences, stress reactivity, and fibromyalgia diagnosis	Review of the literature
Mayou and Bryant (2001)	Longitudinal study of consequences of traffic accidents 3 months and 1 year later	Sample: 1,148 individuals aged 17–69 having been in a road accident Tools: Medical file, PSS-SR, and self-reports
McWilliams et al. (2003)	Explore comorbidity links between mood disorders, anxiety disorders, and chronic pain in a large cohort	Sample: 5,877 participants representative of national population Tools: CIDI, self-reporting of pain
Otis et al. (2010)	Study of the comorbid link between PTSD and chronic pain.	Sample: 149 veterans participating in a pain-management program Tools: PCL-M, BDI, MPQ, and WHYMPI
Poundja et al. (2006)	Evaluate implications and role of depression in PTSD/pain comorbidity	Sample: 130 veterans evaluated and treated for PTSD Tools: Evaluation of PTSD, pain, and depression
Raphael and Spatz Widom (2011)	Longitudinal study of the link between childhood abuse, PTSD, and appearance of chronic pain 30 years later	Sample: 458 adults abused during childhood, 349 adult controls Tools: DIS, different categories of abuse, and self-reporting of pain
Roth et al. (2008)	Assess implications and role of depression in PTSD/chronic pain comorbidity	Sample: Patients reporting symptoms of chronic pain Tools: Assessment of PTSD, depression, and pain
Sachs-Ericsson et al. (2007)	Explore links between childhood abuse, depression, and chronic pain	Sample: 1,727 persons (National Comorbidity Survey) Tools: Questions about type of abuse, pain, and health problems. CIDI for depression.
Sareen et al. (2007)	Address comorbidities, disabilities, and suicidal behaviors among patients suffering from PTSD.	Sample: 36,984 persons over age 15 Tools: Various mental disorders tested on CIDI, and measures of quality of life, disabilities, and suicidal behavior
Shipherd et al. (2007)	Evaluation of PTSD treatment among veterans	Sample: 85 veterans treated for PTSD Tools: Assessment of pain and symptoms of PTSD before and after treatment
Sterling et al. (2005)	Prospective study of factors affecting development and maintenance of chronic pain and disability. Six-month follow-up of diffuse pain.	Sample: 76 persons suffering from diffuse pain Tools: Initial assessment: motor functions, physiological responses, and psychological disturbances (including IES). Neck Disability Index scores after 6 months.
Sterling and Kenardy (2006)	Explore differences in sensitivity and reaction of central nervous system among patients suffering from diffuse pain with or without a post-traumatic reaction	Sample: 66 patients suffering from diffuse pain Tools: Assessment of initial sensitivity, physiological response of nervous system, and PTSD symptoms
Van Loey et al. (2003)	Longitudinal study of predictive factors of PTSD onset after severe burns	Sample: 301 persons hospitalized for burns, 66% exhibiting PTSD 3 weeks after incident Tools: Self-reporting of peritraumatic mental state, pain-related anxiety, and post-trauma symptoms
VonKorff et al. (2005)	Assessment of comorbidity links between lower back or neck pain and psychological disorders	Sample: 5,692 adults from general population Tools: Self-reporting of pain and CIDI for comorbid disorders
Zatzick et al. (2007)	Study of link between physical injury and onset of PTSD symptoms	Sample: 2,931 survivors of severe injuries, 3- and 12-month follow-ups Tools: Evaluation of medical file and administration of PCL (PTSD Checklist) after 12 months

BDI, Beck Depression Inventory; CAPS, Clinician-Administered PTSD Scale; CBT, cognitive behavioral therapy; CIDI, Composite International Diagnosis Interview; CWP, Chronic Widespread Pain; DIS, Mental Health Diagnosis Interview Schedule; HAD, Anxiety and Depression; HDRS, Hamilton Depression Rating Scale; IES, Impact Event Scale; MPQ, McGill Pain Questionnaire; PCL-M, PTSD Check List-Military; PSS-SR, PTSD Symptom Scale-Self-Report; PTSD, post-traumatic stress disorder; QOLI, Quality of Life Inventory; SCL-90-R, 90-Item Revised Symptom Checklist; SHQ, Sleep History Questionnaire; SOC, Sense of Coherence Scale; WHYMPI, West Haven-Yale Multidimensional Pain Inventory.

The potential roles of the family and genetic factors in comorbid PTSD and diffuse pain were explored by Arguelles et al. (2006) but the results were not conclusive. The authors tested a large sample of monozygotic ( $n = 1,042$ ) and dizygotic ( $n = 828$ ) twins. Although the two groups did not differ significantly, there was a strong correlation between the diagnosis of PTSD and the presence of diffuse pain.

These studies suggest that measuring comorbidity between chronic pain and PTSD is a difficult undertaking and involves two contradictory approaches. On the one side, the prevalence of chronic pain is measured among PTSD patients; on the other side, the prevalence of PTSD is measured among chronic pain patients. The lack of syndrome-specific tools complicates these measures even more.

### Chronic Pain and PTSD: How Are They Linked?

Longitudinal studies have attempted to answer this question by exploring the long-term link between chronic pain and PTSD. In one study, 23% of individuals exhibited PTSD symptoms 3 months after an accident, but this figure dropped to 17% after 1 year (Mayou & Bryant, 2001). In the case of injury, 7% of the injured individuals said that 3–12 months later, they were still not back to normal. From the standpoint of psychological rehabilitation, the severity of the injury (along with the health problems it entailed) seemed to be a significant predictor of PTSD after 1 year, when the prevalence of PTSD declines. A similar study by Zatzick et al. (2007) but with more severely injured patients showed that 23% of the accident survivors were diagnosed with PTSD after a year. One of the factors associated with PTSD was pain severity, notably after 3 months, with symptoms of one or the other evolving in parallel. Lastly, studies by Sterling and colleagues have looked more specifically at the changing trajectories of pain and PTSD, here again, following a road accident. In 2006, Sterling and Kenardy found evidence of an association between initial sensitivity to pain and PTSD symptoms 6 months after the accident. Pain severity might play a significant role in post-trauma symptoms.

Unlike the above studies, Sterling, Jull, Vicenzino, Kenardy, and Darnell's (2005) study—one of an abundance of studies on road accidents—showed that the initial symptoms of trauma are predictors of a future incapacitation linked to chronic pain. More recently, a 36-month follow-up of road accidents resulting in serious injuries found not only that 44% of the individuals were still suffering from pain after 36 months. They had more symptoms of PTSD, depression, anxiety, disability, and medical leaves of absence from work than those who were no longer enduring pain (Jenewein et al., 2009).

These longitudinal studies have brought out a tight link between pain and PTSD, and seem to show that the initially perceived strength of injury-related pain is a good predictor

of the development of PTSD, just as the onset of PTSD appears to predict the development of chronic pain. This reciprocal interdependence is consistent with Sharp and Harvey (2001) and Asmundson et al.'s (2002) initial theories on the common factors mentioned above.

### Chronic Pain, PTSD, and Other Comorbid Disorders

As a whole, pain appears to be comorbid with a number of disorders. Although there is no doubt—whether in research or clinical practice—about the existence of such links, the nature of these intermingled connections is still a current question. A recent study showed that while pain is strongly correlated with anxiety-depression disorders, it is likely to make these disorders more serious and lead to their chronicity (Gerrits et al., 2012).

Anxiety disorders seem to play an important role in the comorbidity of chronic pain and PTSD, as previously described by Sharp and Harvey (2001) and Asmundson et al. (2002). Jakupcak et al. (2006) supported these theories by suggesting that anxiety sensitivity is a maintenance factor of PTSD/chronic pain comorbidity. Among the various anxiety disorders, panic disorder and PTSD were found to have the highest degree of comorbidity with chronic pain (McWilliams, Cox, & Enns, 2003). The presence of several anxiety disorders was significantly associated with greater disability. Pain- or trauma-linked anxiety has also been shown to be a good predictor of the severity and chronicity of painful trauma-related disorders (Van Loey, Maas, Faber, & Taal, 2003). Van Loey et al.'s (2003) longitudinal study on 301 patients indicated that peritraumatic dissociation, pain-related anxiety, injury severity, and gender were significant predictors of PTSD severity 1 year later. In another study, PTSD sufferers experienced more chronic pain, more severe pain, and pain in more areas of the body than did persons with a secondary anxiety disorder (or persons in the control group). Persons with PTSD may also exhibit greater sensitivity to painful stimuli (Defrin et al., 2008).

Jakupcak et al. (2006) highlighted the role of depression in maintaining PTSD/chronic pain comorbidity among veterans. This was confirmed by several other studies (Otis et al., 2010; Poundja, Fikretoglu, & Brunet, 2006). In their study, Roth, Geisser, and Bates (2008) proposed a model linking these different symptoms: PTSD is thought to be directly associated with depression whereas depression would affect both the pain's intensity, and more indirectly, the individual's route toward disability. Future longitudinal studies are needed to confirm these preliminary results.

In a literature review, Bob (2008) explored the links between pain, dissociation, and self-representation, increasing an understanding of pain from the neurophysiological standpoint of dissociation. In this view, pain is regarded as an unconscious modification of one's self-representation within

an episode of dissociation, which frequently occurs along with the traumatic event. During the event, a somatic self-identity would be created and dissociated from the subliminal self-representation. The dissociative dimension is another new angle for understanding trauma (Van der Hart, Nijenhuis, & Steele, 2010).

PTSD, then, is likely linked to chronic pain. However, certain types of traumas or events seem to be more likely than others to trigger this reciprocal interdependence. In 2007, Sachs-Ericsson, Kendall-Tackett, and Hernandez looked at the connection between abuse in childhood and chronic pain in adulthood. They found a greater proportion of health problems, notably more pain and depression, among persons reporting childhood abuse. Depression was strongly linked to pain but was not found to be the mediating factor between childhood abuse and the onset of pain. Lee (2010) explored the relationship between childhood abuse, stress reactivity, and neurobiological abnormalities. His review of the literature pointed out a significant association between childhood abuse and a fibromyalgia diagnosis in adulthood. However, he noted that childhood abuse may be an etiological factor of fibromyalgia, given that abuse can lead to abnormal neuroendocrine development, thereby increasing the stress reactivity potentially related to the onset of fibromyalgia. Precisely in the case of fibromyalgia, a study on a very large cohort (Haviland, Morton, Oda, & Fraser, 2010) showed that a diagnosis of fibromyalgia was closely tied to two types of trauma: sexual aggression and abuse, and physical aggression and abuse. Psychological violence, neglect, and major life events were not associated with fibromyalgia.

A retrospective study covering a period of 30 years (Raphael & Spatz Widom, 2011) pointed out some associations between childhood abuse, PTSD, and pain in adulthood. Despite the patients' difficulty retrieving memories over such a long period, childhood abuse was nonetheless found to be weakly linked to a risk of adulthood pain. PTSD, on the other hand, had higher correlations with childhood abuse and the risk of adulthood pain. The combination of childhood abuse and PTSD incurred a highly significant risk of chronic pain in adulthood. PTSD, then, seems to be a mediator between traumatic experiences and the onset of chronic pain.

The importance of investigating this question becomes quite clear when we consider the implications of these diverse comorbidities on a patient's quality of life (Clapp, Beck, Palyo, & Grant, 2008). The association of PTSD and chronic pain seems to have a greater impact on the quality of life of persons who have had road accidents than each of these disorders taken separately.

## Discussion

Although there is strong evidence that PTSD and chronic pain are linked, the nature of this complex link remains ill

defined. It is difficult to draw a straight line from the cause to the effect in explaining the onset of one or the other of these two syndromes. Depending on the population studied and the disorder initially assessed, pain can contribute to the onset of PTSD and also maintain it; the same holds true for PTSD, which can act both as a triggering factor and a maintenance factor of chronic pain. Investigators in this field have also demonstrated the critical role of anxiety-depression disorders as mediators of this comorbidity. No matter the nature of the link, PTSD/chronic pain comorbidity seems to occupy a place of its own in clinical practice.

It seems that DSM-V acknowledges the important part played by pain in the new PTSD criteria proposed. Indeed, criterion A (event exposure) has been extended to include exposure to an actual or threatened severe injury (to oneself or to others). Furthermore, criterion C now includes reviviscence of the event and physical sensations (American Psychiatric Association, 2013).

Although the criteria for PTSD are precise and it is recognized as a potentially chronic disorder if not treated (Riggs, Rothbaum, & Foa, 1995), this is not true of chronic pain. In addition to the IASP definition (Merskey & Bogduk, 1994), this syndrome has a number of nosological descriptions with imprecise criteria such as "a pain disorder associated with both psychological factors and a general medical condition." But chronic pain can take on many diverse forms. Some aspects of the heterogeneity of its etiology and maintenance have been addressed here. Again, the new DSM-V seems to both broaden and deepen our understanding of pain by proposing that it should be seen as a "complex somatic syndrome disorder" or as a specificity of a "somatic syndrome disorder." Furthermore, DSM-V differentiates diagnostically between a pain disorder and adjustment disorders, which belong to the set of anxiety disorders. Thus, the connection between pain disorders and anxiety disorders is beginning to emerge, and the road to understanding PTSD/chronic pain comorbidity seems to be widening as new nosological definitions are acquired.

## Conclusion

Does this make it legitimate to consider chronic pain occurring in PTSD as a reactive kind of pain? If so, should treatment for patients with post-traumatic stress be aimed at making the pain disappear? The articles selected and studied in the present review, although diverse if not contradictory, have one basic thing in common: the trauma. Across all populations, types of pain, and PTSD studied, the common factor that overarches this link lies at the level of the trauma or traumatic event that caused the individual to develop PTSD, chronic pain, or even other comorbid disorders. It would seem, then, that to gain insight into the complex interdependence of these disorders, one should start from the traumatic

event. In this approach, one would see chronic pain as a reactive response of the same order as PTSD, but with the two having different response modes. Within one and the same model of the development of PTSD following a traumatic event, chronic pain would be another possible response to the trauma. Accordingly, the question of the link between PTSD and chronic pain would no longer be posed in terms of cause and effect along an array of possible responses to the trauma. An individual would react in one way or the other, depending on his/her own particular mode of functioning. In this view, PTSD and chronic pain are situated on the same level. Associated comorbid disorders such as depression and generalized anxiety would come into the picture as symptom-worsening conditions.

Vulnerability to the development of a reactive disorder such as chronic pain or PTSD is thought to be related not only to anxiety sensitivity (Asmundson et al., 2002; Jakupcak et al., 2006) but also to traumatic life events experienced during childhood (Haviland et al., 2010; Lee, 2010; Raphael & Spatz Widom, 2011; Sachs-Ericsson, Kendall-Tackett, & Hernandez, 2007). The pediatric population is having a different vulnerability given their changing development. In adulthood, a traumatic event is going to upset the individual's life. Different modes of response are then possible, two of which are PTSD and/or chronic pain. Worsened by comorbid disorders such as depression (Jakupcak et al., 2006; Otis et al., 2010; Poundja et al., 2006; Roth et al., 2008) or anxiety (Defrin et al., 2008; Van Loey et al., 2003), the pain would become chronic. The comorbid symptomatology of PTSD and chronic pain as a reaction to trauma is the principal idea set forth by Sharp and Harvey (2001). The tight interdependence of symptoms that can be observed in both PTSD and chronic pain syndromes lends support to the idea that these disorders should be situated on the same level, that of a reactive disorder.

But why, then, couldn't we contend that this is one and the same reactive disorder? What differences can be found between the two syndromes? A key factor for gaining insight into this question is the temporal course of the reaction, that is, whether it bears heavily on the individual's mode of functioning, with a greater or lesser tendency toward somatization. Indeed, various longitudinal studies have pointed out a sequence of steps leading up to PTSD and chronic pain. While the pain felt right after the accident or traumatic event is an aggravating or even a predictive factor of the onset of PTSD, PTSD turns out to be an aggravating or even predictive factor of the transition from acute pain to chronic pain. The temporal dimension thus seems to have some explanatory power in accounting for the complex interaction of these disorders, with PTSD being an indicator of a quasi-immediate trauma and chronic pain an indicator of an older and perhaps deeper trauma. Indeed, we consider that PTSD is a reaction, which appears a few months following the traumatic event, in agree-

ment with the criteria of DSM-IV-R, while the chronic pain would have remained unsettled, and which would go on much longer.

### Implications for Nursing Practice

The comorbidity between PTSD and chronic pain raises questions about effective treatment. Although we already know of some effective therapies for PTSD, such as eye movement desensitization and reprocessing and cognitive behavioral therapy (CBT), few studies have looked into the effectiveness of joint therapy for PTSD and chronic pain. Therapy programs now in use, particularly CBT, focus largely on the trauma itself, in the hope of decreasing pain (regarded therein as a comorbid or reactive disorder) via psychoeducation on pain and PTSD, relaxation sessions, and sessions involving trauma exposure/desensitization (Asmundson & Hadjistavropoulos, 2006). Individuals have exhibited a significant decrease not only in PTSD symptoms but also in chronic pain, suggesting that PTSD treatment can have a significant impact on pain (Beck, Coffey, Foy, Keane, & Blanchard, 2009; Shipherd et al., 2007).

Given the current challenges for nursing practice in treating patients with PTSD and chronic pain, it seems crucial to find the most effective clinical management. The various forms of therapy and treatment mentioned above focus on PTSD, but also assess any additional effects on chronic pain. It can be hypothesized that treating chronic pain might have a beneficial impact on PTSD symptoms. Owing to the high comorbidity between chronic pain and PTSD, therapy that includes treatment of both syndromes would be a better, more effective choice. The studies reviewed here point out some worthwhile avenues of research and show that these critical issues are still open for debate.

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