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CHRONIC PAIN IN SURVIVORS OF TORTURE – Psyche or Soma?

Stine Amris

Persistent pain related to the musculo-skeletal system is the most frequent reported physical complaint in survivors of torture. In spite of a long-standing tradition of multidisciplinary rehabilitation, however, there is no consensus on how chronic pain and pain-related disability are best addressed within this clinical practice. Are pain problems in torture survivors to be viewed as a somatic problem and intensively investigated and managed as such, or assumed to be the presentation/concomitant of psychological disturbance such as depression, anxiety, posttraumatic stress disorder, or other trauma-related problem?

The current paper is intended as an overview of chronic pain in torture survivors viewed from the perspectives offered by the interactive and multivariate theoretical models of pain. According to these models pain should be viewed not as the result of either solely physical or solely psychological causes, but rather as a set of bio-physiological, psychosocial and behavioural factors contributing to the total experience of pain.

Consequently, appropriate assessment of chronic pain requires assessment of more than just the direct components of pain. Given the complexity inherent in the construct of subjective pain, there is a need to obtain a diversity of assessment information that must then be integrated to understand the individuals' pain and to contribute to treatment decision-making. Overemphasising the importance of psychological aspects, however, may result in insufficient somatic pain diagnoses and reduced treatment efficacy.

Basic knowledge of the physiology of pain is therefore a prerequisite when assessing, diagnosing, and managing individuals suffering from chronic pain conditions. A brief introduction to the physiology of pain has therefore been enclosed in this paper, focusing on chronic, persistent pain and the pain signalling system under abnormal conditions. Possible pain generating mechanisms in chronic post-torture pain are highlighted and how to use clinical information and an understanding of pain classification to identify these mechanisms.

Clinically, a failure to appreciate the intricacies of the relation and co-occurrence of trauma-related problems and chronic pain carries a risk of poor clinical decision-making, selection for treatment, and design of therapeutic intervention.

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It is advocated that chronic post-torture pain should be viewed from the perspectives offered by the interactive and multivariate models of pain and stress, and that knowledge-based clinical guidelines for the assessment and interdisciplinary management emphasising biomedical, behavioural, and cognitive aspects of chronic pain and pain-associated disability in torture survivors should be developed based on these models.

1. Introduction

Over the past 35 years, major research advances have greatly increased our understanding of pain and modern concepts of pain are based on »the Gate Control Theory of Pain« formulated by Melzack & Wall in 1965. This theory expanded the conceptualisation of pain from a purely sensory phenomenon based on a »one-way«, non-modulated system, to a multidimensional model that integrates motivational-affective and cognitive-evaluative components with sensory-physiological ones.

As of today substantial clinical and experimental evidence has proven the existence of multiple ascending and descending neural pathways related to pain perception (Hunt, 2002), and more recently brain imaging techniques such as positron emission topography (PET) and functional nuclear magnetic resonance (fNMR) has shown that pain is processed in the brain by a »matrix« of supraspinal structures rather than by any single structure (Bingle, 2002; Peyron, 2003).

Gating concepts have therefore been further developed into multifactorial neuromatrix models, which proposes an interrelated and multidimensional pain experience as determined by genetic and sensory influences and the learned experience. The neuromatrix is also modulated by cognitive events, such as psychological stress and neuro-humeral responses (Melzack, 2000).

Consequently, pain should be viewed *not* as the result of either solely physical or solely psychological causes, but rather as a set of bio-physiological, psychosocial, and behavioural factors contributing to the total experience of pain.

Since Melzack & Wall's pioneering work several investigators have emphasised that pain that extend over time has an important impact on all domains of the sufferer’s life. Pain problems have been viewed as complex, developmental processes where various psychosocial factors play an important role. The gate theory has encouraged the investigation of the nature of pain-associated disability and has led to the development of biopsychosocial models (Waddell, 1998) that have attempted a wide integration of physical, psychological, and social perspectives.

Accordingly, appropriate assessment of chronic pain patients requires assessment of much more than just the direct components of pain. Given

the complexity inherent in the construct of subjective pain, there is a need to obtain a diversity of assessment information that must then be integrated to understand the patient's pain and to contribute to treatment decision-making (Turk, 2002).

Pain related to the musculo-skeletal system is one of the most frequent physical complaints of torture survivors (Petersen, 1985; Rasmussen, 1990; Shrestha, 1998; Edston, 1999; Burnett, 2001, Amris, 2003). Even though psychological complications are no doubt a major component, most of the torture survivors experience and present their pain and pain-related disability as somatic disease.

There is no consensus on the extent to which chronic pain and pain-related disability in torture survivors are best addressed as medical/physical problems and intensively investigated, or assumed to be the presentation of psychological disturbance such as depression, chronic anxiety, and chronic post-traumatic stress disorder (PTSD) or other trauma-related problems. Overemphasising the importance of the psychological aspects, however, may result in insufficient somatic pain diagnoses and reduced treatment efficacy with continuing negative outcomes (Williams & Amris, 2002).

The current paper is intended as a synthesis of the existing knowledge on chronic pain in torture survivors applying theoretical models and clinical experience derived from mainstream pain research. Finally, the paper will close with a call for continued research, which is needed within all the aspects of post-torture pain.

2. Nociception and pain

Health care providers have long considered pain as being synonymous with nociceptive stimulation and pathology. It is important, however, to make a distinction between *nociception*, *pain, pain behaviour* and *suffering* as illustrated in Fig.1 and Fig.2.

Nociception is the *physiological processing* of stimuli that are defined as related to the stimulation of peripheral pain receptors (nociceptors) and capable of being experienced as pain.

Pain, because it involves conscious awareness, selective abstraction, appraisal, ascribing meaning, and learning, is best viewed, as *a perceptual process* comprised of the integration and modulation of a number of afferent and efferent processes (Melzack, 1968).

Suffering, which is the negative impact of pain on life functioning, is largely associated with the interpretative processes and subsequent responses to the perception of pain, and pain behaviour the observable result of pain experience and suffering.

Thus the experience of pain should not be equated with peripheral stimulation and physiological processing of pain stimuli.

Basic knowledge of the physiology of pain, however, is a precondition when assessing, diagnosing, and managing patients suffering from chronic pain conditions. The following paragraph is therefore meant as a brief introduction to the physiology of pain, focusing on chronic/persistent pain and the pain signalling system under abnormal conditions, which will be applied to highlight possible mechanisms subserving chronic post-torture pain.

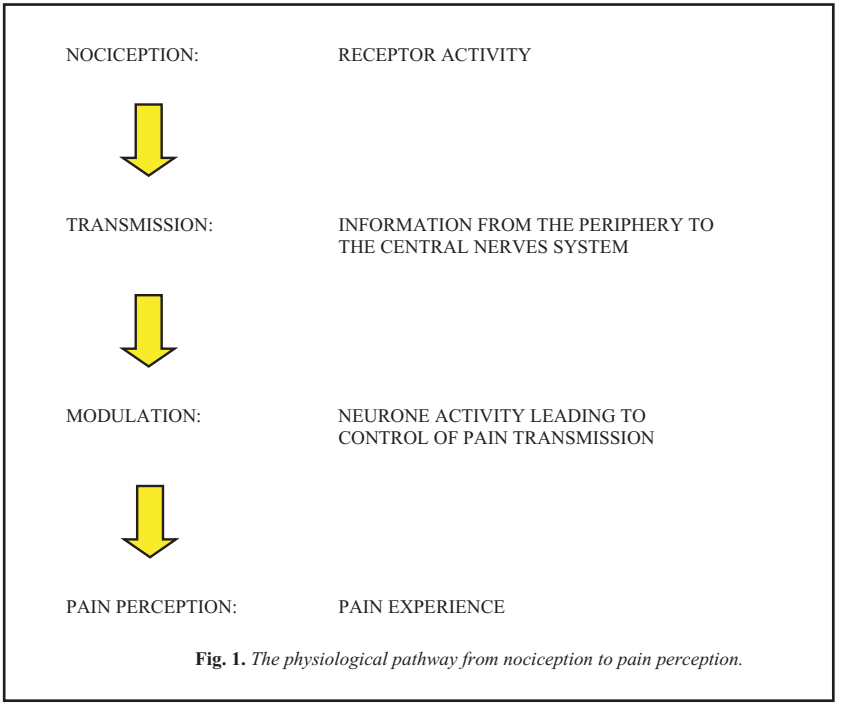

Fig. 1. *The physiological pathway from nociception to pain perception.*

3. The pain signalling system and pathophysiology of chronic pain

Acute pain

Acute pain as a reaction to tissue damage is a normal, physiological phenomenon – a warning signal, necessary for survival and for maintaining the integrity of the organism. The pain disappears when the tissue lesion has healed and the pain stimulus has stopped.

In acute pain, the pain signal is generated by activation of anatomically and physiologically specialised free nerve endings (nociceptors) situated in the peripheral tissues. Nociceptors are activated by different noxious

stimuli e.g. mechanical (pressure, traction), thermal (heat, cold), and chemical stimuli. The chemical nociceptors are activated by different organic, chemical substances, which are released in the tissues as a reaction to inflammation and tissue injury.

When the nociceptor is activated, the pain impulse is conducted via the nerve fibre to the posterior horns of the spinal cord, and from there to the brain stem and higher cortical areas of the brain. In normal circumstances, these incoming (ascending) pain impulses are controlled or modulated (Fig.3). The spinal cord posterior horn cells receive converging impulses from the periphery, as well as descending inhibitory serotonergic and noradrenergic impulses from the brain (spinal modulation). The more central parts of the brain stem and the brain are subject to a similar control (supraspinal modulation).

The pain signalling system is therefore not a »one-to one« system. The magnitude of the pain signal is determined by the activity at nociceptor level, transmission of incoming pain signals to the spinal cord and higher brain areas, and neurone activity leading to control (modulation) of pain transmission.

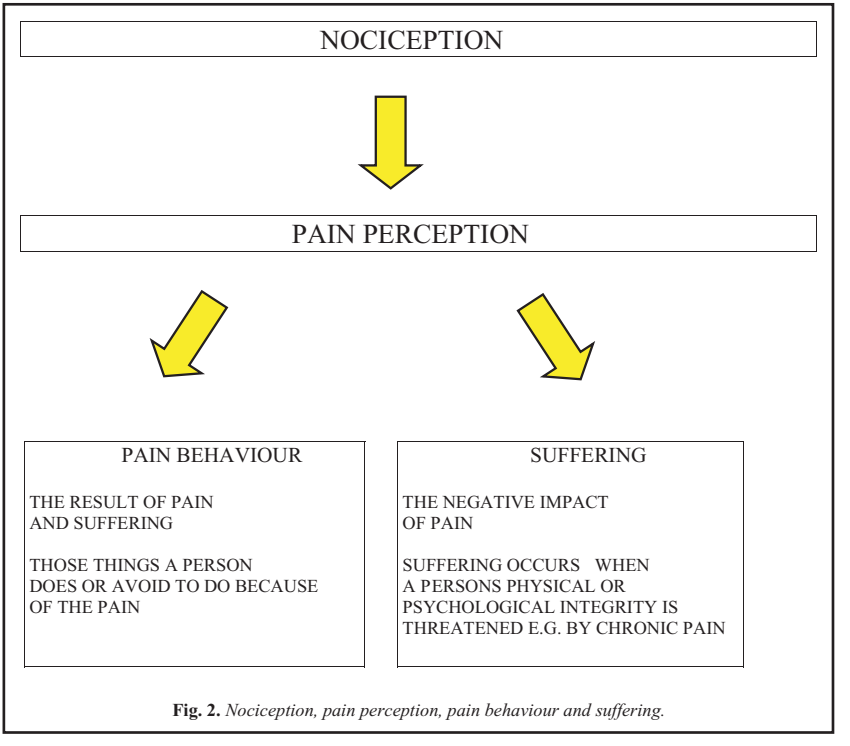

Fig. 2. *Nociception, pain perception, pain behaviour and suffering.*

Chronic/persistent pain

Chronic/persistent pain can be a sustained sensory abnormality occurring as a result of an ongoing peripheral pathology, such as chronic inflammation, or it can be autonomous, independent of the trigger that initiate it (Woolf, 1994). In the latter case, it is changes in the nervous system that has become the pathology, and the pain is maladaptive, offering no survival advantages.

Accordingly chronic, persistent pain can be classified as:

1. Nociceptive – conditions with an ongoing tissue damaging process, the pain being elicited from peripheral nociceptors, or

2. Neurogenic – conditions in which the pain is caused by lesions or dysfunction in the pain signalling parts of the nervous system.

From acute to chronic pain

In contrast to other sensory systems, the pain system is not static, but changes in a dynamic fashion whenever the system has been activated. This adaptability – so called *neuroplasticity* – is a unique capacity in the pain signalling system, where suppression (inhibition) as well as enhanced response (sensitisation) is possible modes of action.

Sensitisation (enhanced response) induced by tissue injury and inflammation is a normal response in the pain signalling system. The system returns to a normal physiological level of functioning, when the tissue lesion heals and the inflammation subsides – the acute pain response.

Irreversible changes may, however, occur with failure of the system returning back to normal resulting in persistent, chronic pain.

Adaptability in the nervous system with an in-built potential of sensitisation of peripheral as well as central pain signalling systems probably plays a crucial role in the development of chronic pain conditions. Sensitisation of peripheral nociceptors or peripheral nerve lesions bring about an intense bombardment of the transmission cells of the spinal cord and brain stem, leading to the next step in the cascade, i.e. sensitisation of the central nervous system. The greater the magnitude of the stimulus and the longer the duration of the nociceptive input from the periphery, the more extensive the neuroplastic changes, and thus the risk of chronic changes. The end result may be spontaneous activity of the neurones in the spinal cord, i.e. a situation in which pain may continue without peripheral impulses – so called *centralisation of pain* or *centralised pain*.

The body's own pain-inhibiting systems, e.g. endogenous opioids and descending pain-inhibiting pathways, may also be involved. Decreased activity of these systems has been shown in experimental neurogenic pain (Woolf, 1994).

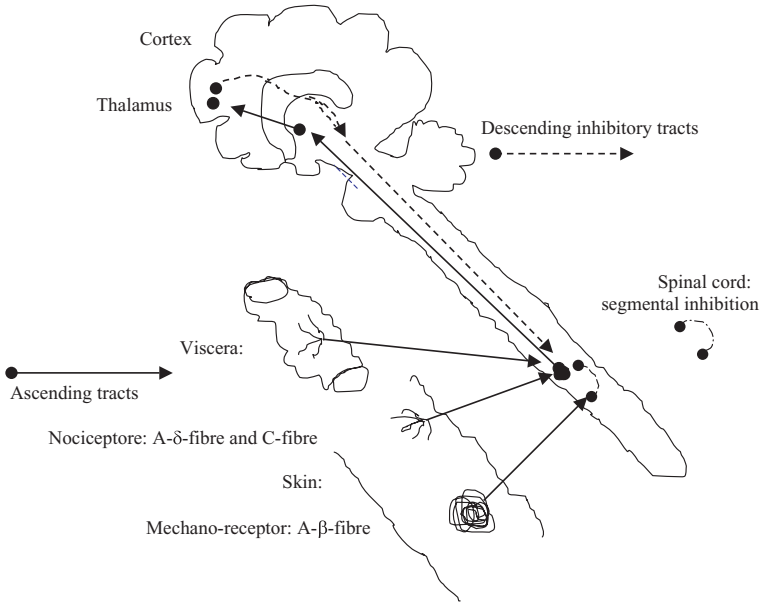

Fig. 3. *The pain signalling system*

Aside from peripheral and spinal plasticity, evidence is accumulating that in long-standing cases of chronic pain, plastic changes may also occur in the areas of the cerebral cortex dealing with pain information. Such plastic changes will influence the overall pain experience and pain behaviour (Petrovic, 1999).

Acute pain has in this way a »build in« potential of becoming chronic. It is therefore not the duration of the pain that differs acute from chronic pain, but the body's inability to restore physiological functions to a normal homeostatic level.

4. The prevalence and character of chronic pain in torture populations

The health-related consequences of torture are likely to be influenced by many interrelated internal and external factors, including cultural meaning of torture, cultural meaning of symptoms and illnesses, the social context before, during and after torture as well as cultural determined community values and attitudes. For this reason one should not assume that torture has the same outcome in different individuals and in different socio-cultural settings.

Little is known about the magnitude and character of chronic pain conditions in survivors of torture, as systematic epidemiological studies of torture pain are lacking. Data exist from descriptive studies often conducted in selected populations, applying different methodologies and not focused specifically on questions of pain. Estimations of the prevalence of post-torture pain in non-selected populations and knowledge about the time aspect and natural course of pain are not available. Nevertheless, clinical experience and published data on physical sequelae after torture are consistent in reporting a high prevalence of musculo-skeletal pain in torture survivors (Petersen, 1985; Rasmussen, 1990; Shrestha, 1998; Edston, 1999; Burnett, 2001).

Confirming this, a newly conducted study including rehabilitation centres specialised in treatment of torture victims in Indonesia, Kenya, Bosnia and Guatemala showed that similarities were present in the reporting of symptoms regardless of variance in applied torture methods, context of torture and social and cultural differences. Across all centres pain related to the musculo-skeletal system was reported as being the predominant physical complaint (Amris, 2003).

In a retrospective study conducted at the Rehabilitation and Research Centre for Torture Victims in Copenhagen (RCT), it was shown that in this highly selected study population 63% of the clients had widespread musculo-skeletal pain complaints, with reporting of pain in 3 or more body regions (unpublished data). The reported regional pain distribution and applied physical torture methods in the study sample are illustrated in table 1 and table 2. The clients in this study sample were examined in average 10,5 years after imprisonment and exposure to torture indicating a substantial chronicity of pain conditions in torture populations.

5. Pain mechanisms in torture victims

Theoretical, interactive models of pain place emphasis on biological as well as environmental circumstances, as an explanation for the development of chronic pain conditions. These models are explicitly tailored towards explanations for chronic and musculo-skeletal pain problems that develop long after apparent injury.

The concepts of pain syndromes evolving over time, which are predicted by the severity, extent and repetition of the original traumas could be valid to post-torture pain syndromes, but the aetiology and pathogenesis of chronic pain in torture victims are not fully understood, as relevant scientific studies addressing the subject are missing.

A seemingly discrepancy between the often pronounced subjective pain complaints and few objective findings, though, has led to the classification of the symptoms as psychosomatic (Burnett, 2001). This discrepancy,

however, does not necessarily mean that the symptoms are psychosomatic or should be ascribed entirely to psychological mechanisms, but may indicate that the cause of the pain is to be found in the pain signalling parts of the central nervous system rather than in peripheral tissue structures and organs (Amris, 2000, 2001).

Applying knowledge derived from mainstream pain research, the following pain mechanisms may, theoretically, be considered as subserving chronic post-torture pain.

Pain location	Percentage of clients
Headache	93%
Neck and shoulder girdle	93%
Upper extremities incl. joints	54%
Thorax incl. the thoracic spine	38%
Low back	87%
Lower extremities incl. joints	71%
Feet	53%
3 or more regions (except headache)	63%

Tabel 1: *Pain location distributed on 7 body regions.* 46 torture victims examined in average 10,5 years after exposure to torture at RCT in the period 1996-1997.

Physical torture methods	Percentage of clients
Unsystematic beating	100%
Suspension	80%
Falanga	80%
Strapping	39%
Forced positions	24%
Electrical torture	44%
Sexual torture	37%
Burning/other mutilation	29%
Submersion	24%
Telephono	28%

Tabel 2: *10 most frequent reported physical torture methods in the study sample.* 46 torture victims from Middle East countries examined at RCT in the period 1996-1997.

Nociceptive pain

Physical torture is in many instances directed towards the musculo-skeletal system, aiming at producing soft tissue lesions (lesions of muscles, ligaments, tendons, joint capsules, nerves, etc.) and pain. Beatings, strapping, suspension by the extremities, long-standing forced positions, and electrical torture are frequent applied torture methods (Rasmussen, 1990), which all carry the risk of producing musculo-skeletal injury.

Structures in the musculo-skeletal system – joint, joint capsules, tendons, ligaments and muscles – are all richly innervated by nociceptors. Persistent nociceptive pain elicited from peripheral nociceptors is therefore a possible pain mechanism in torture survivors, due to:

1. Permanent injury in the musculo-skeletal system caused by the torture itself e.g. lesion of the shoulder joints after suspension by the upper extremities, lesion of the knee joints after forced long-standing knee-loading positions, or lesion of plantar structures after falanga (beatings of the soles), and

2. Injury in the musculo-skeletal system secondary to the torture caused by over-load and disuse due to e.g. compensatory altered movement patterns as seen in torture victims with low back pain or pain in the feet after exposure to falanga torture (Amris, 2001).

Neurogenic pain

Nerve lesions caused by e.g. blows, strangulation and traction are probably common in torture victims and neurogenic pain caused by peripheral nerve lesions therefore a potential pain mechanism.

Neurogenic pain in torture victims has been described, relating the pain syndrome to the use of specific torture methods (Ôge, 1997; Thomsen, 2000; Moreno, 2002):

– peripheral neuropathy of the feet after exposure to falanga
– neurogenic pain due to partial lesion of the brachial plexus (the nerve plexus to the arm) after suspension by the upper extremities
– partial lesion of the lumbo-sacral plexus (the nerve plexus to the legs) after suspension by the lower extremities
– segmentary, radiating neuralgic pain after forced, back-loading positions
– trigeminal neuralgia related to head trauma

Development of chronic pain syndromes after exposure to electrical torture has also been described and related to lesions in the central nervous system (Moreno, 2002).

Altered central pain modulation (centralised pain)

Throughout the years, several chronic muscular pain syndromes have been described. These syndromes share common characteristics, not unlike the constellation of symptoms found in many torture victims: regional or diffuse pain in the musculo-skeletal system often associated with poor sleep, fatigue, paresthesia, headache, and irritative symptoms from the bowel and bladder (Wallace, 1999).

The aetiology and pathogenesis of the chronic muscular pain syndromes are not fully understood, but today there is general agreement that changes in spinal and supraspinal pain-modulating mechanisms are of central importance (Wallace, 1999). Some authors have suggested that the associated irritable organ manifestations are related to this abnormal pain modulation, as manifested by increased sensitivity of the mucous membranes of the organs (Chang, 2000; Wallace, 1999).

An altered central pain modulation in which the pain can continue without peripheral impulses, and thus without obvious changes in peripheral tissues and organs, is another possible pain mechanism in torture victims and might explain the relative few objectives findings contrasting the widespread pain complaints (Amris, 2000).

Psychological mechanisms

An organic foundation for the pain does not rule out the importance of psychological mechanisms influencing the overall pain experience, and explains why tissue-focused treatments alone often fail to relieve chronic pain and pain-related disability.

The influence of mood and cognition on the experience of pain – and, conversely, the effects of pain on psychological state and behaviour – are universally accepted. Psychological distress, particularly clinical depression and anxiety disorders, has been cited as frequent concomitant of chronic pain (Banks, 1996). The perception of pain bears a complex relationship to nociception, and a full understanding requires considerations both of central mechanisms involved in coding the information in the brain and of secondary psychological processes affecting pain perception. Research into memory of pain e.g. suggests that aversive pain memories may have a powerful influence of the perception of new pain stimuli (Price, 1997).

Elaboration of traditional psychodynamic models (Blumer, 1982), and the articulation of operant conditioning (Fordyce, 1976) and cognitive-behavioural (Turk, 1983) conceptualisations of chronic pain, have encouraged considerations of psychological and interpersonal factors in the development and maintenance of the pain problem (Fig.4).

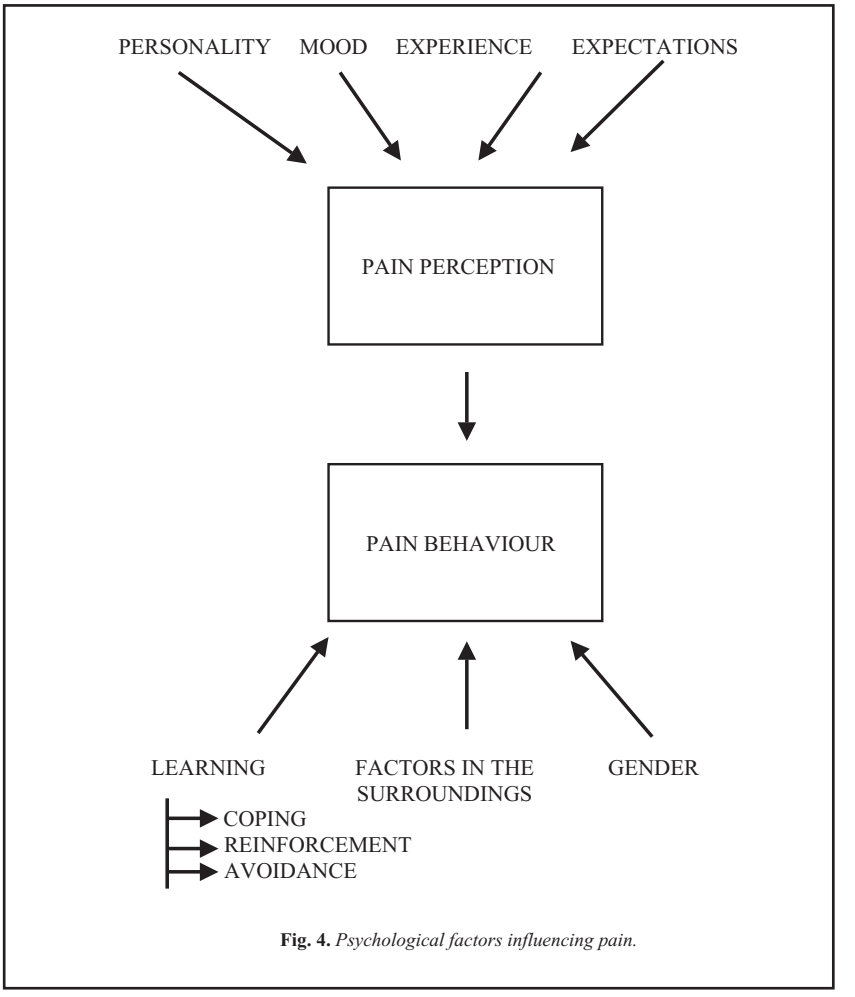

Fig. 4. *Psychological factors influencing pain.*

Research has shown that patients' beliefs about pain, attention to pain, appraisals of its significance, fears about pain, and pain-related coping strategies exert an important influence on responses to treatment and development of disability (Main, 2002).

Within the classical conditioning paradigm, pain behaviour can be viewed simply as an unconditioned response to a pain stimulus (nociception). Through learning, however, conditioning can occur so that fearful patients may begin to show similar responses to situations in which they were injured. Even *memory* of the circumstances surrounding the injury can reproduce the pain – and »fear of pain can become more disabling than the pain itself« (Waddell, 1993). Fear-avoidance, which refers to the avoidance of movements or activities based on fear, has therefore been put

forward as a central mechanism in the development of persistent musculoskeletal pain disorders related to injury.

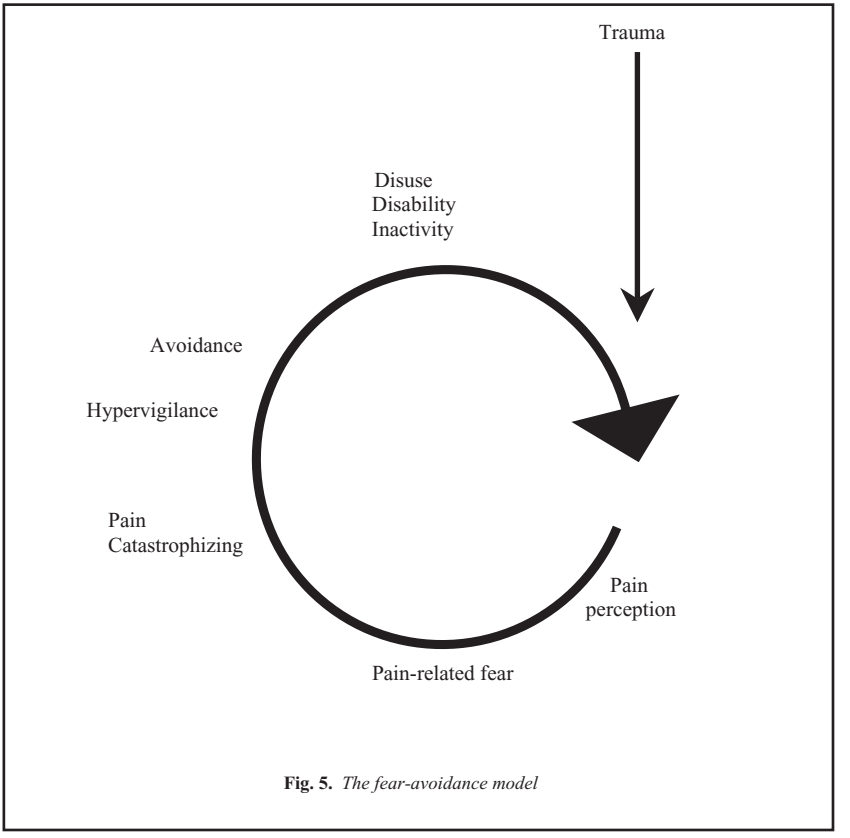

Fig. 5. *The fear-avoidance model*

The fear-avoidance model

The fear-avoidance model presents possible pathways by which injured patients get caught in a downward spiral of increasing avoidance, disability and pain (Fig.5). The model, which have been reviewed and amended by Vlaeyen and Linton (2000), predicts that there are several ways by which pain-related fear can lead to disability:

1. Negative appraisals about pain and its consequences, such as catastrophic thinking, are considered a potential precursor of pain-related fear.

2. Fear is characterised by escape and avoidance behaviours, of which the immediate consequences are that daily activities expected to produce pain are not accomplished any more. Avoidance of daily activities results in functional disability.

3. Because avoidance behaviours occur in anticipation of pain rather than as a response to pain, these behaviours may persists because there are fewer opportunities to correct the wrongful expectancies and beliefs about pain as a signal of threat to physical integrity.

4. Long-standing avoidance and physical inactivity has a detrimental impact on the musculo-skeletal and cardiovascular system, leading to the so called 'disuse syndrome', which may further worsen the pain problem. Avoidance also means the withdrawal from essential reinforcers increasing mood disturbances such as irritability, frustration and depression, which in turn may promote the painful experience.

From a cognitive-behavioural perspective, there are a number of additional predictions that can be derived from the model:

5. Like other forms of fear and anxiety, pain-related fear interferes with cognitive functioning. Fearful patients will attend more to possible signals of threat (hypervigilance) and will be less able to shift attention away from pain-related information. This will be at the expense of other tasks including actively coping with problems of daily life.

6. Pain-related fear will be associated with increased psychophysiological reactivity, when the individual is confronted with situations that are appraised as 'dangerous'.

A large number of mainly cross-sectional studies has shown that pain-related fear is one of the most potent predictors of observable physical performance and self-reported disability levels (Vlaeyen, 2000).

In a small study conducted at the RCT including 28 torture victims (average age of 38 +/– 6,67 years) with widespread chronic pain, it was shown that self-rated measures of physical disability based on performance of 12 activities of daily living was very high, indicating a high degree of pain disability and loss of physical function in this selected population (Amris, 2002). Pain-related fear and avoidance should therefore be considered as part of a possible pathway to loss of physical function in torture survivors and reflected in the assessment and planning of treatment programs.

The co-occurrence and relation of chronic pain and PTSD

Recent evidence indicates that pain is one of the most commonly reported somatic symptoms of patients with PTSD, regardless of the nature of the traumatic experience, e.g. military combat, motor vehicle accident, or sexual assault (Asmundson, 2002; Otis, 2003). In a study performed by Beckham et al. (1997) to evaluate chronic pain patterns in Vietnam

veterans with PTSD, 80 percent reported the presence of a chronic pain condition.

Similarly, a growing number of studies have shown that PTSD symptoms tend to be elevated in, and to impact on, patients with chronic pain (Asmundson, 2002). It appears that between 10 percent and 50 percent of patients attending multidisciplinary pain clinics for treatment of chronic pain and pain related disorders have symptoms that satisfy diagnostic criteria for PTSD, compared with approximately 8 percent of the background population. In a study of patients with chronic musculo-skeletal pain associated with work-related injury, 34,7 percent were found to have symptoms consistent with a diagnosis of PTSD. An elevated prevalence of PTSD symptoms has also been shown in patients with fibromyalgia (Asmundson, 2002).

Furthermore, PTSD and PTSD symptoms are reported to be strongly associated with current pain, overall pain ratings, and pain-related disability (Beckham, 1997; Bryant, 1999). Cumulative negative impact upon particular PTSD symptoms – physical reaction to reminders of the trauma, feeling emotionally numb, having a foreshortened future, and hypervigilance – when pain co-occurs with PTSD have also been indicated by recent studies (Asmundson, 2002).

PTSD and chronic pain share common phenomenological characteristics: anxiety and hyperarousal, behavioural avoidance, emotional lability, and attentional bias toward somatic cues. Further, preliminary data suggests that stress responses and pain modulation are dysregulated in both conditions (Ibarra, 1994; Kosek, 1996). Collectively, these findings indicates that PTSD and chronic pain share similar response patterns in the cognitive, behavioural, and physiological dimension (Asmundson, 2002).

Theoretical models explaining how PTSD and chronic pain are closely linked and influence each other have therefore been suggested among which are »the shared vulnerability model« and the »mutual maintenance model«.

Shared vulnerability model

Since PTSD and chronic pain frequently co-occur, it seems plausible that there may be individual difference factors predisposing people to one or both conditions. While several constructs hold promise, including the constructs of trait negative affectivity and harm avoidance, it is anxiety sensitivity that has proven most fruitful as a predisposing factor (Asmundson, 2002). Anxiety sensitivity denotes a dispositional tendency to become fearful and, more specifically, refers to the fear of anxiety symptoms based on the belief that they may have a harmful consequence.

Anxiety sensitivity has been shown to be elevated in patients with PTSD and in some, but not all samples of patients with chronic pain (Asmundson, 2002). It has also been shown that the severity of anxiety sensitivity

is positively correlated with severity of PTSD symptoms (Fedoroff, 2000). It has therefore been suggested that elevated anxiety sensitivity represents the bridge, or shared vulnerability between PTSD and chronic pain. That is, the tendency to respond with fear to symptoms of anxiety is thought to predate the development of PTSD and chronic pain.

In the case of PTSD, the degree of alarm caused by the stressor itself combined with alarm related to the anxiety sensations arising from the stressor amplifies the emotional reaction and thereby increases the risk of developing PTSD. In the case of chronic pain, it also appears that anxiety sensitivity amplifies fear, anxiety, and associated avoidance responses when pain-related experiences occurs, thereby increasing the likelihood that pain will be maintained over time. When the traumatic stressor and pain-precipitating event are the same or occur in close temporal proximity, anxiety sensitivity may amplify the collective response and may increase vulnerability for development of both conditions (Asmundson, 2002).

Growing evidence suggests that there may be a genetic basis for this shared vulnerability, since data indicate that genetic factors play a role in anxiety sensitivity, PTSD, and chronic pain (Asmundson, 2002).

Mutual maintenance model

In this model proposed by Sharp and Harvey (2001) it is suggested that certain components of chronic pain (cognitive, affective, and behavioural) maintain or exacerbate symptoms associated with PTSD and, likewise, that components of PTSD (physiological, affective, and behavioural) maintain or exacerbate symptoms associated with chronic pain.

The model holds that chronic pain serves as a persistent reminder of the trauma and, conversely, that arousal triggered by the reminder promotes avoidance of pain-related situations and thereby functional limitations and disability.

Clinical implications

Since evidence supports the notion that there may be a shared vulnerability between PTSD and chronic pain and that, when symptoms do co-occur they are mutually maintaining, it is imperative that clinicians be aware of the relation.

Literature suggests, that when PTSD and pain symptoms co-occur it is likely that clinicians will be requested to modify treatment protocols to address both PTSD symptoms and pain management strategies. Current evidence indicate that incorporating treatments to reduce anxiety sensitivity may improve the treatment of PTSD and chronic pain, or quite likely, both, when they co-occur (Asmundson, 2002).

As chronic pain is reported to be the most prevalent somatic complaint in torture survivors, PTSD and PTSD symptoms are reported to be the most frequent psychological sequelae (Gurr, 2001). As of today, though,

there are no studies addressing the relation and co-occurrence of PTSD and pain in this specific population. Research is therefore needed in order to advance theory development on the relation between chronic pain and maladaptive responses of prolonged stress in torture survivors and for a knowledge-based development of applied clinical practices.

6. The »psychosocial dimension« of chronic pain and the biopsychosocial model

Although biomedical factors appear to instigate the initial report of pain in the majority of cases, psychosocial and behavioural factors may serve over time to exacerbate and maintain levels of pain and subsequent disability. A theoretical model – *the biopsychosocial model* – has therefore been suggested (Waddell, 1998) to explain how psychosocial and behavioural factors may serve to maintain pain and pain-related disability. The biopsychosocial model originates from the interactive models of pain (Melzack, 1965) and cognitive-behavioural models of learning (Fordyce, 1976; Turk, 1983).

The core of the biopsychosocial model is the assumption of an ongoing sensation that is nociceptive in nature or perceived by the sufferer as being painful. The patients' cognitions, i.e. what they think and understand about this sensation, will influence their emotional reactions to it. The behaviour demonstrated by the individual at any point of time will be a product of his or her beliefs and emotional response to the pain and may in turn be influenced (reinforced or modulated) by the social environment in which the behaviour takes place. The model offers a way of understanding the nature of pain-related incapacity and a framework for the assessment and management of chronic pain conditions integrating physical, psychological and social perspectives.

Central to the assessment of the psychosocial context of the chronic pain experience is attention to the role of the family. Strong empirical support for a role of the family in the perpetuation of chronic pain and associated disability and distress has accumulated over the past years (Kerns, 1999).

Two distinct theories of family functioning have particularly influenced the field of chronic pain and pain management (Jacob, 2001). The integration of family systems and family stress theories has led to the development of a single influential framework for understanding the role of the family with a chronically ill individual, including an individual with persistent pain.

This model, *the family adjustment and adaptation response model*, emphasises the complexity of family functioning, particularly principles of system theory, in attempting to explain the family's response to a member's experience of persistent pain (Patterson, 1988; Patterson, 1994). The

cognitive-behavioural perspective, specifically as it has been informed by operant conditioning theory and to the extent that it emphasises the central role of pain-relevant communication has also been important.

Research has shown that perceived social support is associated with decreased depressed mood and better adjustment to chronic pain, and that significant others solicitous response to pain behaviour is associated with greater disability, higher ratings of pain intensity and observed pain behaviour (Romano, 1996).

7. Clinical assessment of torture victims with chronic pain

Pain history

> *»I am always in pain. Some days my pain is terrible and extremely intensive. On these days, the pain starts at my feet and spreads up throughout the body to the top of my head. It tears my body, spreading upwards like quick waves. Sometimes the pain turns my body into a piece of ice – it feels as if the entire cold of the world is inside of me. At other times my body turns into a fire. It feels as if my body is burning and stinging – like a hot iron. It burns like madness and is extremely painful. When my pain is that pronounced, I can not move or change position, then I get terrible, excruciating pain. I can not wear any cloth because the contact between the cloth and my skin elicit horrifying pain – even the air hurts.*
>
> *When my pain gets that bad, I isolate myself from my surroundings. There is only one thing I can do. I go to the bathroom and pours water over my body. Cold water if my body is burning, hot water if my body is ice. I stand in the shower and let the water flow down my body in the opposite direction of the pain, which feels nice. I stand there for hours.*
>
> *Other days my pain is less and is only felt in parts of my body – in the feet, in the back and in my shoulders. Theses are the days I feel the best.«*

This citation from a torture victim's pain-diary illustrates how torture victims often present and describe their pain. It also depicts how much chronic pain interferes with daily living and the quality of life and why chronic pain may represent a barrier to rehabilitation, especially if misinterpreted and incorrectly managed.

A thorough pain history is essential when diagnosing and planning management of chronic pain conditions. The history should clarify pain

location, distribution, intensity, quality and time course, and interference with daily activities.

In torture victims the pain history should contain the following specific information:

Applied torture methods in order to obtain knowledge about possible injuries in the musculo-skeletal and peripheral nervous system inflicted by the torture as related to potential pain mechanisms. Basic knowledge about physical torture methods and their potential trauma mechanisms is therefore a prerequisite assessing torture victims with chronic pain conditions.

Debut of the pain(s) in relation to torture exposure. Was the pain present before the torture or is the onset of pain related to exposure to torture. Most torture victims attribute the debut of pain to the torture, and can tell that the pain has been constantly present since with a varying intensity. It is important to remember that neurogenic pain often appears delayed after a variable pain free interval. Some torture victims tell that immediately after torture they had severe pain, which declined over months, to suddenly reappear intensified and with a different quality.

The pain quality. A description of the pain quality is important in order to differentiate between nociceptive and neurogenic pain. Most often different qualities of pain will be present at the same time and each pain quality should be described separately. The following aspects should be enclosed in the description: is the pain localised or diffuse; is it superficial or deep; is the character of the pain e.g. burning, prickling (dysesthesia), or lancinating, shooting (neuralgia), or is it throbbing, aching, pressing, cramping of character; is the pain spontaneous or provoked, is there irradiating pain, and/or concomitant sensory disturbances (numbness, pins and needles).

Nociceptive pain is most often described as localised, deep, throbbing, aching, pressing, or cramping of character and objective signs of tissue damage/inflammation are present at examination.

Clinically, neurogenic pain is characterised by the lack of obvious signs of tissue damage and by a delayed onset, often with a pain free interval of several months. The pain is described in different ways, but often as diffuse, burning, prickling (dysesthesia), and/or shooting like electrical shock, following the nerve distribution (neuralgia).

A prominent feature of neurogenic pain is sensory disturbances. Especially characteristic is the presence of *allodynia*. Allodynia is a sign of hyperactivity (sensitisation) of the pain signalling system and is defined as »pain elicited by a normally non-painful stimulus« . If allodynia is present, even the lightest of touches to the skin provokes excruciating pain that might last for hours.

Additionally, there may be signs of hyperactivity of the sympathetic nervous system e.g. increased sweating, changes of skin temperature, and

trophic and colour changes of the skin due to increased vascular reactivity.

Taking this part of the pain history may represent a problem especially if a language barrier necessitates the use of an interpreter. The interpreter should be carefully instructed to translate the pain description as thorough as possible using the clients own words, but still there is a risk that nuances may get lost in the translation. Another consideration is the inter-cultural dimension – is 'pain language' universal? Most often, though, torture victims describe their pain quality using metaphors that makes a distinction possible, as illustrated by the above citation.

Localisation of the pain. In many torture victims the pain is diffuse with a pain distribution as seen in the generalised muscle pain syndromes: diffuse pain in the muscles, pain related to the joints, the spine and the pelvic girdle. Localised pain is most often described as: headache; pain in the neck and shoulder girdle with or without irradiation to the upper extremities; low back pain with or without irradiation to the lower extremities; and pain in the feet and lower legs. It can be useful to ask the torture victim to fill in a pain drawing showing the distribution of the pain, irradiation of pain, and areas of sensory disturbances marked with different symbols on a body chart.

Pain intensity and variation of pain intensity over time. Registration of pain intensity can be done using verbal rating scales (none, mild, moderate, severe pain) or visual analogue scales (100 mm VAS) at clinical examination and as follow-up on pain management. The description of the time aspect should include information about the presence of the pain. Is the pain periodical or constant? Is there any variation in pain intensity during the day, week, or month? Is pain present at night influencing the quality of sleep? Most often torture victims describe their pain as being constantly present, the intensity varying with pain exacerbations lasting for days or weeks.

Pain interference. A description of pain interference with performance of physical activities and engagement in social activities is important in order to obtain information about the severity of the pain condition and in planning of treatment. Pain provoking and pain relieving factors should be described as well. Torture victims often describe their pain to be provoked/intensified by physical activity, cold, and psychological distress. Pain relieving factors may be heat, relaxation, and rest.

Psychological assessment

A thorough assessment of individuals with chronic pain must include an assessment of the psychological and social factors associated with their subjective experiences and pain behaviours.

Basic cognitive factors such as pain control beliefs, self-efficacy beliefs, fear-avoidance beliefs, and coping styles and strategies together with

emotional features among which anxiety, depression, and anger are the most common in chronic pain patients should be evaluated as a part of the clinical assessment.

The goals of the psychological assessment in chronic pain patients should, according to Romano (1989), be:

1. To identify psychosocial factors that may affect pain perception and behaviour as well as functional impairment.

2. To identify specific treatment goals for each patient, and

3. To identify intervention strategies that may produce maximum patient improvement.

Keefe et al. (1999) described in detail, several basic elements that are common to almost any psychological assessment, which should be addressed in the evaluation of pain patients:

1. Clinical history reported by the patient
2. General personality traits and dispositions
3. Current level of somatic concern, depression and anger
4. Report of pain and functional limitations
5. Preliminary behavioural analysis
6. Pain coping strategies
7. Beliefs about injury, pain, and treatment outcome
8. Social, economic, and occupational influences on symptom presentation.

It has been increasingly recognised that assessment is context-specific and that there is no all-embracing psychological tool or method of assessment of patients suffering from chronic pain (Main, 2002). Several assessment tools are available e.g. self-report instruments that are used to evaluate patients' psychological status, environmental stressors, pain-related disability, fear of pain, and readiness to adopt self-management strategies. Psychological assessment of patients with persistent pain requires at least one interview and the administration of one or more self-report measures.

Assessment in the context of clinical decision making, selection for treatment, and design of therapeutic interventions is, however, still poorly understood. The shift in purpose of assessment from identifying psychopathology to determining targets for intervention and obstacles to improved function or recovery offers further challenges in terms of psychological assessment (Main, 2002). This statement may be even more valid addressing psychological assessment of torture survivors suffering from chronic pain.

Physical assessment

The physical assessment of torture victims with chronic musculo-skeletal pain should focus on the musculo-skeletal system and a thorough neurological evaluation. The purpose of the assessment being (Amris, 2002):

1. To identify lesions in the musculo-skeletal system caused by the torture
2. To identify pain generating mechanisms
3. To identify mechanism for the development and maintenance of musculo-skeletal disability
4. To identify targets for intervention aiming at an overall improvement of function.

Applying the biopsychosocial model the physical assessment should include an assessment at the body systems level as well as at the level of the individual – an assessment of impairment of body functions, limitation of activities, and restriction of participation (Fig.6).

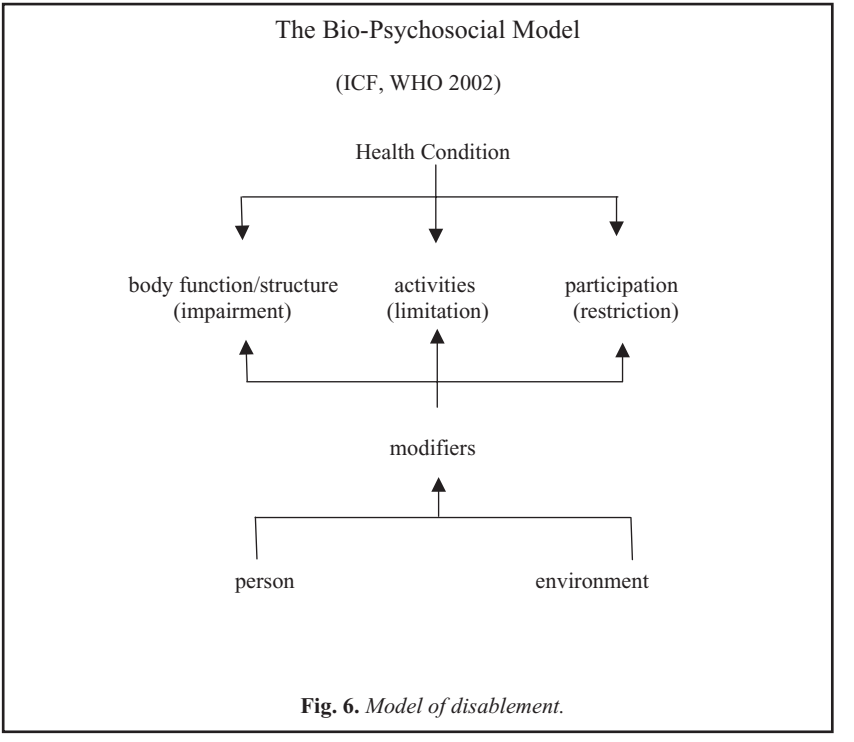

Fig. 6. *Model of disablement.*

Body function

Assessment of body function entails an assessment of the function of the individual components and structures in the musculo-skeletal system – joints, muscles, and nervous system. Range of movements in joints and joint function, muscle strength and muscle function, motor control, aerobic capacity and other such physical capacities are viewed at the level of impairment.

A thorough assessment of the musculo-skeletal system in torture survivors is time consuming. Most often the torture survivor has been exposed to several different types of physical torture and presents – at the time of examination – widespread pain complaints and complaints of physical impairments, necessitating examination of most of the musculo-skeletal structures.

Knowledge about frequent applied torture methods and their possible consequences is therefore a prerequisite for a systematic and goal oriented examination.

A torture victim complaining about pain and impaired shoulder function after exposure to suspension by the upper extremities e.g. should be carefully examined not only in order to disclose pathology in the shoulder joint and surrounding soft tissues. A thorough neurological examination should also be performed in order to exclude nerve lesion, known to be caused by nerve traction during suspension, as a cause of pain.

Activities of daily living

Disability is concerned with activity restriction of the person; some indicators include locomotion, personal care, family, and occupational roles. These indicators are noted at the level of the person and are measurable in that the functional limitation expresses itself as a reality in everyday life without reference to others.

Assessment of the activity dimension is based on clinical interview, observation, and standardised questionnaires most often in the form of self-reporting of physical function. Functional disability instruments can include measurement of typical activities of daily living (ADL's), such as walking, bathing, or dressing. The measurement of disability to document the impact of pain may also involve therapist ratings of observed activity.

Participation

Restriction of participation represents the disadvantage for a given individual resulting from the presence of impairments or disabilities that limit the fulfilment of normal roles. As opposed to the assessment of the individual's abilities in relation to relevant aspects of his or her situation, restriction of participation is a consequence based on the circumstances of the disabled individual that place him or her at a disadvantage relative to

others. It thus reflects the value society attach to the disability and the role of the environment.

Assessment of the participation dimension is based on clinical interview often including significant others e.g. family, observation, and standardised questionnaires mainly in the form of health-related quality of life instruments.

The impact of torture on 'social health' is described in terms of impairment of role-model coping, interpersonal interactions, and social participation leading to social isolation and stigmatisation, family and marital problems (Gurr, 2001), factors all of which may have a negative influence on pain, pain-related disability and outcome of treatment. A baseline assessment of the domains of activity and participation when evaluating torture survivors suffering from chronic pain seems therefore a prerequisite for an optimal planning of care.

Clinical assessment in order to diagnose neurogenic pain

Patients in chronic pain rely on the clinician to identify the pain generating mechanism using clinical information and an understanding of pain classification. Classically, patients with neurogenic pain complain of spontaneous pain (pain that arise without detectable stimulation) and evoked pain (abnormal responses to stimuli).

Subjective pain experience, particularly sensory pain description (pain quality), is often used in the identification of neurogenic pain. Research has shown that the six sensory descriptors more frequently used by patients with neurogenic pain are electric chock, burning, cold, prickling, tingling, and itching (Bennett, 2001).

Abnormal responses to stimuli indicative of sensory dysfunction, which can be demonstrated at bedside examination, are:

- decreased sensation (hypoesthesia)
- increased sensation (hyperesthesia)
- increased pain sensation (hyperalgesia)
- pain elicited by a normally non-noxious stimuli (allodynia)
- summation of pain (increased pain intensity on repeated stimulation)
- after sensations (persistent pain long after stimulation has ceased)

A clinical diagnose of neurogenic pain should be based on analysis of sensory pain description and bedside examination of sensory dysfunction. The diagnosis should only be made when the distribution of pain and the associated sensory abnormalities jointly, and in a clinical context, point to a neurological condition. Others stress that the most important feature is pain occurring in an area of abnormal or absent sensation (Bennett, 2001). Nerve dysfunction in this context can be represented by sensory, motor or autonomic dysfunction attributable to a discrete neurological lesion.

8. Management of chronic pain conditions

There are no systematic studies addressing treatment and outcome of treatment in torture survivors with chronic pain. Given the complexity of the health-related and social consequences of torture, refugee trauma and a life in exile, pain is only one of many problems to be addressed. This said pain treatment is often at risk of being neglected in this specific population, the problem being interpreted in 'overpsychological' terms by health professionals unfamiliar with pain diagnosis and treatment.

In the general care of chronic pain patients, a movement away from traditional disease-oriented models of illness in favour of broader biopsychosocial perspectives has led to a shift from a primary focus on pain relief to a broader agenda of pain management, emphasising behavioural and cognitive aspects of pain and pain-associated dysfunction. Evidence increasingly lends support to the use of an *interdisciplinary* approach to patients with chronic pain in which the patient receives comprehensive rehabilitation that includes multiple therapies provided in a coordinated manner (Chapman, 1999).

Interdisciplinary management of chronic pain

Interdisciplinary treatment is according to Fordyce (1973) defined as: »multiple therapies provided in a co-ordinated manner. Each of the participating professions needs the other to accomplish what, *collectively*, they have agreed are their objectives.« The core in interdisciplinary treatment is therefore *a common treatment goal*, which is achieved through contributions from different professional disciplines.

In the interdisciplinary management of chronic pain the core team typically comprises a pain-managing physician, a psychologist, a nurse, a physiotherapist, and a vocational counsellor. The care team tailors the care plan according to the needs of the patient, with a focus on achieving measurable treatment goals established together with the patient. An open discussion on treatment goals is essential before the therapy begins, as it is particularly important for the team to address the patient's expectations. The overall goal of pain management is to control pain and to rehabilitate to the best possible physical and psychological function. In many cases, however, realistic goals are reduction, but not elimination of pain, improvement in physical functioning, and development of active coping skills.

Treatment modalities in the interdisciplinary management of chronic pain patients should therefore include:

1. Education of the patient in basic pain physiology and psychological aspects of pain and pain behaviour.
2. Psychological intervention. Cognitive-behavioural methods have proved effective in outcome of treatment and are a cornerstone of modern pain

management, whether delivered on an individual basis or within the context of interdisciplinary pain management. Findings in recent studies have proven cognitive-behavioural approaches, in the context of self-directed reactivation, superior to more passive treatment approaches (Main, 2002).
3. Physiotherapy, the principal goal being to reverse, rehabilitate or prevent movement disorders, to alleviate pain, and to enhance overall physical functioning.
4. Social counselling.
5. Pharmacological treatment.

Chronic pain treatment trials have not yet grouped patients by trauma history or attempted treatment matching by trauma history, and there are only few studies designed to address co-occurring PTSD and chronic pain. The theoretical models linking PTSD and chronic pain emphasise, however, the importance of *interdisciplinary pain management* as an integrated part of the multidisciplinary rehabilitation of torture survivors.

Pharmacological treatment of neurogenic pain conditions

Neurogenic pain usually responds poorly to the standard treatments described in the WHO's analgesics ladder and possibilities for pharmacological treatment is comprised by second order analgesics such as antidepressants and antiepileptics.

The analgesic efficacy of these drugs is however in general disappointing providing satisfactory pain relief (defined as a 50% or greater reduction in pain intensity or »moderate« pain relief) in only 50-60% of clinical trial subjects, and the probability of complete pain relief with a single drug being only 10% (Rowbotham, 2002).

Additionally, the incidence of side effects in these types of drugs is high. This should not prevent, though, that pharmacological treatment is instituted. Even a small reduction in pain intensity may have a positive influence on the overall outcome of treatment in the interdisciplinary team and on the quality of life of the patient.

9. Conclusion

Persistent pain is recognised as one of the most frequent physical complaints of survivors of torture. In spite of a long-standing tradition of multidisciplinary rehabilitation of torture survivors, however, there is no consensus on how pain and pain-related disability are best addressed within this clinical practice.

Clinically, a failure to appreciate the intricacies of the relation and co-occurrence of trauma related problems and chronic pain carries a risk of

reduced treatment efficacy and negative outcomes. A basic understanding of the physiology of pain and pain-generating mechanisms in torture survivors will likewise be a prerequisite for correct diagnosis of pain and optimal pain management. We therefore need to expand our clinical derived concepts and re-examine the nature of our professional practice and skills. This must, however, be done within a knowledge-based framework.

Chronic post- torture pain should therefore be viewed from the perspectives offered by the interactive and multivariate models of pain and stress, integrating bio-physiological, psychosocial, and behavioural factors in the total experience of pain.

Knowledge-based clinical guidelines for the assessment and interdisciplinary management emphasising biomedical, behavioural and cognitive aspects of chronic pain and pain-associated disability in torture survivors should be developed based on these theoretical models, and knowledge derived from future research on chronic post-torture pain.

10. Implications for future research

Research in chronic post-torture pain is lacking in all areas and as of today there are more questions than answers. The lack of such research is unfortunate since it could significantly advance theory development and improve treatment efficacy. Research in chronic pain and pain-related disability should therefore be clinical relevant, aiming at identifying relationships between pain and a number of clinical, functional, and psychosocial factors as well as theoretical, focusing on pain aetiology and development of validated assessment methods.

In order that pain are more effectively managed in the overall rehabilitation of torture survivors, an increased knowledge on the following aspects is needed:

1. The magnitude, character and cross-cultural aspects of chronic pain in torture populations including time aspects and natural courses of pain.
2. Pain mechanisms subserving chronic pain conditions following torture and the relation with applied torture methods and specific torture induced lesions.
3. The relation between chronic pain and maladaptive responses of prolonged stress in survivors of torture.
4. Prediction of pain and pain outcome following treatment in torture populations based on relationships between clinical, functional, psychobehavioural and psychosocial factors.

Development of multidimensional assessment instruments validated to assess pain and pain associated dysfunction in torture populations will be a prerequisite. In the light of the global extent of pain problems among torture survivors assessment methods, applicable in different socio-cultural settings and adaptable to differences in treatment traditions and preferences, and available resources, should be prioritised.

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