

**An Investigation of the Impact of Stress, Appraisal and
Coping Strategies on Pain Intensity in a
Chronic Pain Population**

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ABSTRACT

The aim of the study was to investigate the application of aspects of Lazarus and Folkman's theory of Stress, Appraisal and Coping, to the chronic pain experience. In this context, the researcher explored the relationship between pain intensity and stress level. The association between pain intensity and the intensity of negative or positive attitudes towards the pain experience was also investigated. In addition, the relationship between pain intensity and the frequency of employing active, problem focused coping-strategies, or passive, emotion focused strategies, was explored. 105 subjects completed the South African Chronic Pain Questionnaire; an assessment tool based on adapted internationally validated measures. Findings suggest that there is a proportional relationship between pain intensity and stress level in the present chronic pain population. A positive relationship between pain intensity and the intensity of negative attitudes was revealed. A positive relationship was also reflected between pain intensity and the employ of passive, emotion-focused coping-strategies. There is a paucity of research that provides a theoretical framework in which to conceptualize the association between stress, appraisal and coping in chronic pain. To this end, the researcher has employed Lazarus and Folkman's theory in order to conceptualize the relationship between these variables and chronic pain intensity.

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CHAPTER ONE:

INTRODUCTION

Twenty five to thirty percent of the population in industrialized countries suffer from chronic pain, making it the most common form of disability (Bonica, 1990). Chronic pain is associated with negative personal, social and economic consequences (Shipton, 1993). It also represents a potential burden to both the practitioner and the health-care system (Bonica, 1990). Individual characteristics, interpersonal relationships, the intervention that the patient receives from the health-care system and the broader context in which the person exists, all mediate the pain experience (Katz, 2000). Within this context of chronic pain having a multidimensional nature, the focus of a substantial amount of research has been on the relationship between chronic pain and stress, appraisal and coping, respectively.

Recent pain research has focused on unraveling both the physiological and psychosocial aspects of chronic pain. Historically there was conflict and debate surrounding which aspect was most relevant in chronic pain. The dual concept of chronic pain being both a perceptual and physiological process, is due largely to the pioneering work done by Melzack and Wall (Melzack & Wall, 1965, Melzack & Wall, 1996). The conceptualization of stress as a transactional process has been extensively employed in evaluating the psychobehavioural aspects of chronic pain (Jensen, Turner, Romano & Karoly, 1991). These models have provided the basis for two distinct but inter-related areas of research, that is, establishing the neurophysiological mechanisms of chronic pain and evaluating the impact of psychobehavioural strategies on adjustment to this disease.

Research into the cognitive-behavioural aspects of chronic pain in the last decade has attempted to investigate the postulates of stress theory in chronic pain (Jensen et al., 1991). Much effort has been focused on identifying appraisals and coping-strategies that are relevant to both positive and negative adjustment, as these may provide useful therapeutic targets for improving the long-term functioning of chronic pain patients (Jensen et al., 1991).

A problem with chronic pain literature is that it has been largely atheoretical. One of the purposes of this research is to test the applicability of a theoretical framework to aspects of the chronic pain experience. Given the importance of stress theory in chronic pain research and that quantitative research has confirmed this to a large extent, the researcher proposes Lazarus and Folkman's

theory (1984a) as a framework in which to conceptualize the relationship between stress, appraisal and coping in a chronic pain population. The potential relevance of such a framework to clinical practice is to provide the practitioner with a method of conceptualizing the patients' pain experience and thereby influence his/her therapeutic intervention.

The aim of the study is thus to investigate the application of aspects of Lazarus and Folkman's theory of Stress, Appraisal and Coping (1984a), to the chronic pain experience. In this context, the researcher will investigate the impact of stress, appraisal and coping, on pain intensity, in a chronic pain population.

In the review of literature, the researcher will first provide an overview of pain. Lazarus and Folkman's theory of Stress, Appraisal, and Coping will then be introduced. Research on stress, appraisal and coping in the context of chronic pain, will be reviewed. A motivation for applying Lazarus and Folkman's theory to chronic pain will then be proposed, after which specific hypotheses and the methodology for the study will be presented. The researcher will discuss relevant findings, after which limitations of the current and study and recommendations for future research will be suggested.

CHAPTER TWO: **OVERVIEW OF PAIN**

2.1 Introduction

Pain is a multidimensional phenomenon involving sensory, cognitive, affective and behavioural components (Bonica, 1990). Pain results from a complex and interactive series of mechanisms, integrated at all levels of the neuro-axis from the periphery, via the dorsal horn to higher cerebral structures (Millan, 1999). The focus of this chapter is on chronic pain. The author will first provide a definition of pain, after which the types and categories of pain will be introduced. Theories, pathophysiological mechanisms, psychosocial aspects of the chronic pain experience will also be presented.

2.2 Definition of pain

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. Pain is always subjective. Each individual learns the application of the word through experiences related to injury in early life. Biologists recognize that those stimuli that cause pain are liable to damage tissue. Accordingly, pain is that experience we associate with actual or potential tissue damage. It is unquestionably a sensation in a part or parts of the body, but it is also always unpleasant and therefore also an emotional experience” (IASP, 1982, cited in Bonica, 1990, p. 18).

If people report pain in the absence of any likely pathophysiological cause; this is usually as a consequence of psychopathology. There is usually no way to distinguish these people's experience from that due to tissue damage if we take their subjective report. In such circumstances, the IASP suggests that “if they regard their experience as pain and if they report it in the same ways as pain caused by tissue damage, it should be accepted as pain” (IASP, 1982, cited in Bonica, 1990, p. 18).

The IASP's definition avoids tying pain to a direct stimulus. It suggests that activity induced in the pain receptor and nociceptive pathways by a painful stimulus is not directly proportional to the pain experience. While pain generally has a physical cause, there are always psychological factors associated with this complex experience (IASP, 1982, cited in Bonica, 1990).

2.3 Types of Pain

Four types of pain will be introduced in the following section: somatic pain; visceral pain; neuropathic pain and psychogenic pain. Somatic and visceral pain can both be categorised as being nociceptive. Neuropathic pain is non-nociceptive.

2.3.1 Somatic Pain

Cutaneous nociceptors consist of high threshold mechanoreceptors (thinly myelinated, mainly A-delta fibres with free nerve endings) and polymodal nociceptors (unmyelinated C-fibres with free nerve endings) (Rang, Bevan & Dray, 1991; Woolf, 1991). Nociceptors also occur in other somatic structures such as muscle, fascia, tendons, joints, cornea and tooth pulp.

High intensity noxious stimuli, which may be of a thermal, chemical or mechanical nature, activate these nociceptors. Signals are carried by the A-delta and C-fibres to the central nervous system via afferent neurons (Cimino, 1992). The primary nociceptors synapse in the dorsal horn of the spinal cord onto second-order neurons predominantly in the substantia gelatinosa (Russo & Brose, 1998). These second-order neurons ascend in the spinothalamic tract where their terminal fibres are located, primarily to the thalamus (Russo & Brose, 1998). Third-order neurons then transmit the signal to the somatosensory cortex (Russo & Brose, 1998). In addition, fibres from the thalamus radiate to the limbic system and become involved in the emotional components of pain (Russo & Brose, 1998).

Somatic pain is usually described in terms such as, sharp, aching or throbbing. It is clearly localised, readily recognised and generally responds well to treatment. Typical examples of somatic pain include sprains, fractures, dislocations, muscle aches, arthritic pain and traumatic injury (Shipton, 1993).

2.3.2 Visceral Pain

Visceral pain is due to disease that originates in the viscera or injury that is caused to the internal organs. Such disease processes include inflammation, ischaemia, dilation of hollow viscera, mesenteric stretching or spasm. Visceral pain is described in terms such as dull, aching and gnawing (Ness & Gebhart, 1990). This type of pain is generally more diffuse in its presentation, as compared to somatic pain, which is more localised. After minutes or hours, the pain may be referred to a somatic region, and may manifest with or without hyperalgesia (noxious stimuli which produce a greater and/or more unpleasant pain experience than expected) (Giamberardino

& Vecchiet, 1995). Visceral pain is the most common form of pain produced by disease and one of the most frequent reasons why patients seek medical attention (Cervero & Laird, 1999).

2.3.3 Neuropathic Pain

Neuropathic pain arises because of disease or damage within the peripheral or central nervous system, rather than from nerve terminal excitation in damaged tissue, as is the case with nociceptive (somatic and visceral) pain (Millan, 1999).

Bowsher (1991) noted five main features of neuropathic pain:

1. The pain is described as a burning, stabbing or shooting sensation.
2. The pain generally does not respond well to opioids.
3. The pain is generally associated with instability of the autonomic nervous system.
4. The pain is frequently associated with a clinically evident partial sensory deficit. Thermal sensation is usually affected.
5. Allodynia (lowered pain threshold) to touch, cold and movement may occur in such patients.

2.3.4 Psychogenic Pain

Somatoform disorders are characterized by the presence of physical symptoms that suggest the presence of a general medical condition, but there is no diagnosable organic pathology to adequately account for the patient's physical symptoms (American Psychiatric Association, 1994). The patient's presentation also cannot be accounted for by the direct effects of a substance, or by another psychiatric disorder (American Psychiatric Association, 1994). The physical symptoms are not intentional and cause the patient significant distress and impairment in social, occupational or other areas of functioning (American Psychiatric Association, 1994).

Pain may be a symptom of a somatoform disorder, as is the case with Somatization Disorder (American Psychiatric Association, 1994). In Pain Disorder, however, pain is the predominant focus of the patient's clinical presentation, and is sufficiently severe to warrant clinical attention (American Psychiatric Association, 1994). Psychological factors play a significant role in the onset, exacerbation, maintenance and severity of the patient's pain experience (American Psychiatric Association, 1994). Pain Disorder may be associated with both psychological factors as well as with a medical condition (American Psychiatric Association, 1994). In the absence of psychological factors, the diagnosis of a psychiatric disorder should not be made.

2.4 Categories of Pain

Pain falls into three main categories: acute, chronic and cancer-related (Ashburn & Staats, 1999). Acute pain is a result of damage to tissue, as is the case in injury, trauma or surgery. Acute pain typically resolves as the injured tissue heals or soon thereafter (Ashburn & Staats, 1999). Chronic pain is defined as pain that continues beyond the usual course of disease or injury (Shipton, 1993). Chronic pain may also be due to progressive, non-malignant disease, such as rheumatoid arthritis (Ashburn & Staats, 1999). Cancer-related pain refers to pain that is due to primary tumour growth, metastatic disease, chemotherapy and radiation toxicity (Ashburn & Staats, 1999). One requires an understanding of acute pain in order to understand its progression to chronic pain. Acute pain will thus be briefly introduced. Cancer pain is beyond the scope of this research and will therefore not be considered in this thesis.

2.4.1 Acute Pain

Acute pain consists of a complex constellation of unpleasant sensory, perceptual and emotional experiences, which in turn triggers certain autonomic, psychological and behavioural responses (Bonica, 1990). Injury to, or disease of, somatic structures or viscera may produce noxious stimulation. Abnormal functioning of muscle or viscera that does not actually produce tissue damage, may also initiate the pain experience (Bonica, 1990). Although psychological factors influence the person's pain threshold and overall experience of acute pain, it is not due primarily to environmental or psychopathological influences (Bonica, 1990).

Acute pain has a protective function, warning the individual of damage to his/her body, and triggering a response to withdraw from the harmful stimulus (Thomas, 1997). The survival significance of acute pain can be seen in persons lacking pain sensation, who suffer injuries that can be disabling (Thomson & Steele, 1981). With certain injuries, pain limits the person's capacity for movement, preventing further pathophysiological damage.

When acute pain persists for longer than the expected time frame for an injury to heal, or when pain is associated with progressive non-malignant disease, it is considered to be chronic (Ashburn & Staats, 1999).

2.4.2 Chronic Pain

Chronic pain is a complex sensory and emotional experience, and should be regarded as an independent entity or syndrome (Russo & Brose, 1998). While the duration of pain required to make a diagnosis of chronic pain differs across theorists and practitioners, a diagnosis of chronic pain is generally made if the pain has lasted longer than six months (Russo & Brose, 1998). Common chronic pain syndromes include chronic lower back pain; headache; arthritic conditions, myofascial pain syndrome; fibromyalgia; neuropathic pain; phantom limb pain; and central pain syndromes (Bonica, 1990; Long & Kephart, 1998). Chronic pain patients frequently do not respond effectively to the therapeutic measures that are successful in treating acute pain (Shipton, 1993).

The correlation between tissue pathology and the perceived severity of the chronic pain experience is poor or even absent (Bennett, 1999). Furthermore, the sharp spatial localisation of acute pain is not a feature of chronic pain. The latter is more diffuse and often spreads to areas beyond the original site (Bennett, 1999).

Recent studies indicate that persistent pain should be considered a disease state of the nervous system, not merely a symptom of another disease condition (Basbaum, 1999). With persistent injury or pain, the nervous system undergoes dramatic changes that exacerbate and prolong the pain condition (Basbaum, 1999). Chronic pain syndromes are frequently due to changes in the peripheral or central nervous system, in response to tissue injury. Several changes in the peripheral nervous system occur that persist even after healing has occurred (Ashburn & Staats, 1999; Olgart, 1997). Similarly, changes in the nociceptive processing within the central nervous system can lead to persistent pain (Ashburn & Staats, 1999; Olgart, 1997). In some people, chronic pain presents without any identified ongoing tissue damage or antecedent injury (Bonica, 1990). Chronic pain disorders may also be caused by more than one mechanism, such as nociceptive (somatic or visceral) and neuropathic, each associated with a complex substrate of neurophysiological changes (Gallagher & Verma, 1999).

2.4.2.1 Theories of Chronic Pain

A number of models have attempted to explain chronic pain. These vary from the traditional biomedical view to the psychogenic model (Turk, 1994). The traditional biomedical view assumes a close correlation between the body's biological state and symptom perception (Turk, 1994). In contrast, the psychogenic model suggests that the underlying aetiology of chronic pain

in the absence of objective evidence of organic disease, can be explained by emotional factors, specific personality characteristics, or the presence of a psychiatric disorder (Turk, 1994).

Other models of pain include motivational conceptualisation and operant conditioning (Turk, 1994). Motivational conceptualisation suggests that pain without evidence of an organic disease process may be motivated by secondary gain, frequently being of a financial nature (Turk, 1994). Operant conditioning views pain and pain behaviours as overt communication of distress and suffering that are subject to environmental contingencies of reinforcement (Turk, 1994).

Melzack and Wall (1965) proposed the first model that included both the sensory and perceptual components, (for example, situation, attention and cognitions), that interact at a neurological level to modulate the pain experience. Pain is viewed as consisting of sensory-discriminative, motivational-affective and cognitive-evaluative components (Wall & Melzack, 1989). The Gate Control model postulates that there are important physiological pathways capable of augmenting or diminishing the subjective experience of pain. Melzack and Wall (1965) suggest a dual ascending and inhibitory pathway with signals being modulated at the spinal level. In addition to afferent neural pathways, some of the proposed pathways involve top-down processing: the neurophysiological influence of emotions and cognitive phenomena travels down the spinal cord from the brain and can modulate sensory information travelling up the spinal cord toward the brain (Melzack & Wall, 1996). Thus, the notion of a gating action was proposed, with both physiological and psychological processes being capable of modulating the experience of pain (Melzack & Wall, 1965). More than any other theoretical approach, the Gate Control Theory has emphasised the significant role of psychological variables and how they affect the person's reaction to pain (Wall & Melzack, 1989).

More recently, Melzack (1999) proposed the neuromatrix theory of pain and stress. Melzack states that the multidimensional experience of pain is produced by characteristic "neurosignature" patterns of nerve impulses, generated by a widely distributed neural network (Melzack, 1999). The "neurosignatures may be triggered by sensory input, but they may also be generated independently of them" (Melzack, 1999, p. 89). Output patterns of the neuromatrix activate perceptual, behavioural and homeostatic programs after injury, pathology or other inputs that act on the neuromatrix (Melzack, 1999). Components of the neuromatrix comprise neural perceptual mechanisms and the stress-regulation system. Perceptual mechanisms essentially incorporate the mechanisms of the gate control theory (Melzack & Wall, 1996). Both components interact

dynamically with one another, and the neuromatrix system produces actions and perceptions that persist in time (Melzack, 1999). The neuromatrix is considered to be genetically determined, but is capable of modulation by sensory experience (Melzack, 1999). This model presents advancement in the understanding of chronic pain, by providing a comprehensive model for the multidimensional nature of the pain experience. This model also appears to incorporate adequate explanations for psycho-behavioural, genetic, and homeostatic aspects of chronic pain.

2.4.2.2 The Parallel Processing Model of Pain

Leventhal and Everhart (1980) proposed the Parallel Processing Model of pain. This model suggests that the affective and sensory aspects of the pain stimulus are encoded simultaneously, and that these contribute independently to the overall pain experience. The majority of the processing of both sensation and emotion is thought to occur at a preconscious level, and attention is proposed to play a major role in determining that which is brought into one's awareness (Leventhal & Everhart, 1980).

Dar and Leventhal (1993) propose a mechanism for the Parallel Processing Model, which hypothesizes that as a consequence of exposure to noxious stimuli, individuals form a schema that reflects both the sensory as well as the emotional aspects of the pain experience. The pain schema contains a representation of the noxious stimulus as well as the related sensations, emotions and cognitions that have become associated with the noxious stimulus through previous exposure (Dar & Leventhal, 1993). Additional encounters with noxious events invoke this schema and modify it (Dar & Leventhal, 1993). The schema causes a stimulus to be perceived in a way that is consistent with its components, and thereby determines which aspects of the pain experience will be brought into awareness (Dar & Leventhal, 1993). The pain schema thus biases the perception of the noxious stimulus (Dar & Leventhal, 1993).

The Parallel Processing Model assumes that for the majority of cases, the pain schema is associated with distress (Dar & Leventhal, 1993). This implies that the schema contains both the sensory as well as the emotional distress associated with the pain experience. When a person experiences pain, it is assumed that the schema-congruent components of the situation are brought into awareness. The sensory features are processed simultaneously with the fear, anger and other emotions elicited by the stimulus. Dar and Leventhal (1993) suggest that the negative emotions associated with pain increase the person's suffering, and thereby make the experience more painful. Based on this logic, Dar and Leventhal (1993) hypothesise that processing the

noxious stimulus as a primary sensory experience may decrease both the patient's pain and his/her level of distress.

From a theoretical perspective, it is useful to understand the above-mentioned models in isolation. On a practical level, it is likely that various models interact, contributing to the complex nature of chronic pain, and the difficulty in accurately conceptualising, diagnosing and treating this disease.

2.4.2.3 Pathophysiological and psychological mechanisms of chronic pain

Recent years have seen a progressive unravelling of pain mechanisms at both a neuroanatomical and cellular level (Millan, 1999). The foundations for these mechanisms still have their origins in the Gate Control theory of pain processing. Subsequent studies have confirmed the existence of a highly distributed, bilateral, supraspinal mechanism that is engaged in the processing of pain intensity (Coghill, Sang, Maisog, & Iadarola, 1999).

Bennett (1999) proposed a non-nociceptive pathophysiological basis for chronic non-malignant pain that has two primary components: a sensory component and a psychological component.

2.4.2.3.1 Sensory Component

Bennett (1999) noted the following four characteristic clinical features of non-nociceptive pain (NNP):

1. The degree of tissue damage does not correlate with the report of pain, or there may be no discernible pathology.
2. Hyperalgesia may be experienced.
3. Allodynia (pain resulting from a non-noxious stimulus to the skin, e.g. cold or touch) may be experienced.
4. The pain is experienced beyond the boundary that would be expected on the basis of the site of the original trauma.

The mechanisms postulated for the clinical features of NNP include the following: central sensitisation induced by past or ongoing nociception; nociceptive and non-nociceptive afferents converging on the same secondary neuron in the dorsal horn; low-level stimulation of wide dynamic neurons resulting in pain, and the expansion of receptive fields, with an enlarged area of discerned pain (Bennett, 1999). At a molecular level, studies have demonstrated the role of

neurotransmitters such as substance P, glutamate and neuropeptides in central sensitisation (Russell, Orr, Littman, Vipraio, Aloukrek & Michalek, 1994).

2.4.2.3.2 Psychological Component

Many factors including past experiences, genetic factors, general state of health, cognitions, emotions, methods of coping, and the effectiveness of the patient's support system, all influence the complex experience of pain (Amir, Kaplan, Neumann, Sharabani, Shani & Buskila, 1997; Bandura, 1986; Sigal, 1997; Toomey, Seville, Mann, Abashian & Grant, 1995; Turk, Okifuji, Sinclair & Starz, 1996a; Turk, Okifuji, Starz & Sinclair, 1996b;).

At a physiological level in the brain, the subcortical areas of the thalamus, cingulate gyrus, hippocampus, amygdala and locus ceruleus form a functional unit called the limbic system (Bennett, 1999). The limbic system is responsible for the experience of many affective states, including pleasure, fear and aversion. Sensory input at this level of the brain thus forms the physiological basis for the emotional aspect of pain (Bennett, 1999). Cognitions, emotions and coping methods regarding the pain experience can influence both the sensory pain input into consciousness, as well as the pain sensation (Bennett, 1999). One's emotions, cognition and behaviour can thus moderate the descending control pathways and dampen or amplify the pain that is experienced (Bennett, 1999; Fields, 1984).

2.4.2.4 Chronic Pain and Depression

Chronic pain is commonly complicated by depression, which may add to the patient's level of dysfunction and disability (Gallagher & Verma, 1999). Depression may precede the diagnosis of chronic pain, be a consequence of chronic pain or the two may exist concurrently (Gallagher & Verma, 1997). Patients with depression occurring after the onset of chronic pain were found to have the same rates of affective disorders in family members as in the general population, and significantly lower rates than in families of patients with major depression alone (Gallagher & Verma, 1999). These findings indicate that it is the stress of living with chronic pain, rather than the personal or family predisposition, that contributes to the cause of depression in this subgroup of patients (Gallagher & Verma, 1999).

A review of 191 studies that explored the pain-depression relationship concluded that depression is more common in chronic pain patients than in healthy controls, as a consequence of the presence of chronic pain (Fishbain, Cutler, Rosomoff & Rosomoff, 1997). Predisposition to

depression at pain onset may increase the likelihood for the development of depression in some chronic pain patients (Fishbain et al., 1997). Depression is an important component to consider and to manage in the chronic pain patient. The relationship between pain and depression is however, not explored further in this thesis, as it is not an aspect of focus for the researcher's hypotheses.

2.4.2.5 The pervasive impact of the chronic pain experience

The effect of chronic pain on the patient and his/her social system tends to be more pervasive than that of acute pain. The implications of the injury, past pain experiences, outcome probability, secondary gain, family and cultural influences and effectiveness of the patient's support system are examples of psychosocial factors that may influence the patient's chronic pain experience (Bonica, 1990). Chronic pain often has a profound effect on the patient's mood, thought processes, personality, and behaviour (Ashburn & Staats, 1999). People with chronic pain frequently experience concomitant depression, sleep disturbance, fatigue and decreased overall physical functioning (Ashburn & Staats, 1999). Chronic pain may affect and is frequently affected by interpersonal relationships (Lindegger, 1990). For example, the family may be unaware as to the method of coping with the patient's pain, or they may withdraw due to their own discomfort (Lindegger, 1990). In certain circumstances, pain may serve an important role in family functioning, complicating the compliance of recommended management. Models of stress and coping may also be useful in explaining adjustment differences among chronic pain patients. These relationships are reviewed in greater detail in Chapter Four.

To illustrate the complexity of the psychosocial aspects of chronic pain, Main (1991) proposed a four-dimensional model. It consists of a noxious sensory input component, a motivational-emotional component, a conceptual appraisal component, and a sociocultural component. The physical sensation of pain is thus only one of the many dimensions that must be addressed in the management of the patient with chronic pain. Biological, psychological and social issues should all be considered when conceptualizing, assessing, diagnosing and treating chronic pain (Katz, 2000). A multidisciplinary approach is thus indicated.

2.5 Conclusion

In the above-mentioned chapter, the definitions, concepts, and underlying mechanisms of pain, (in particular chronic pain), have been reviewed. These aspects provide an important background to understanding the multidimensional nature of chronic pain. The neuroanatomy, physiological mechanisms and the psychobehavioural aspects inherent to the chronic pain experience, should all be placed into an integrated context.

CHAPTER THREE:

LAZARUS AND FOLKMAN'S THEORY ON STRESS, APPRAISAL AND COPING

3.1 Introduction

In this chapter, the author will explore the concepts and processes of stress, cognitive appraisal and coping, with respect to Lazarus and Folkman's theory. This theory was published in 1984, and has subsequently been extensively applied to various chronic diseases. The majority of this chapter will be dedicated to highlighting relevant aspects of Lazarus and Folkman's theory (1984a), after which a brief account of its application to chronic disease research will be presented.

3.2 The Stress Concept

Historically, stress has been defined in terms of either stimulus or response. Stimulus definitions focus on events that occur in the environment, where the situation is considered to be stressful (Selye, 1956, cited in Lazarus and Folkman, 1984a). Response definitions refer to a state of stress, where the system is 'stressed' (Wolff, 1953, cited in Lazarus and Folkman, 1984a). Lazarus and Folkman (1984a) take these concepts further and define stress in terms of the relationship between the person and the environment that unfolds over time. Lazarus and Folkman's cognitive theory of stress is thus both relational and process orientated (Folkman, 1984; Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, 1986a). This is analogous to the modern medical concept of disease, which suggests that the development of a disease is dependent on both an external organism/factor and on the body's susceptibility to that organism/factor. Accordingly, Lazarus and Folkman define stress as "... a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being"(Lazarus & Folkman, 1984a, p.19). Whether a particular person-environment relationship is considered to be stressful, is largely determined by cognitive appraisal (Lazarus & Folkman, 1984a).

3.3 The Cognitive Appraisal Processes

Lazarus and Folkman's concept of cognitive appraisal attempts to explain the evaluative cognitive processes that occur between exposure to the stressor and the response (Lazarus & Folkman, 1984a). Through cognitive appraisal processes, the person evaluates the significance of what is happening for his or her well-being and whether he/she has adequate ability and resources

to cope with the situation (Lazarus & Folkman, 1984a). Cognitive appraisal processes may not necessarily be conscious, verbally accessible, deliberate or rational (Lazarus, 1982; Lazarus, 1984).

A distinction between knowledge and appraisal is an important conceptual concern highlighted by Lazarus and Smith (1988). Knowledge is considered to be basic factual cognition about the way things are and how they work, whereas appraisal defines the personal meaning of an encounter for wellbeing. While personal meaning is defined with simultaneous reference to the person and the environment, appraisal is also dependent on knowledge (Lazarus & Smith, 1988). Lazarus and Folkman identify three kinds of cognitive appraisal processes: primary, secondary and reappraisal (Lazarus & Folkman, 1984a).

Primary appraisal consists of one's first cognitive response to an event, in which one decides whether there is anything personally at stake in the situation or encounter (Folkman, Lazarus, Gruen & DeLongis, 1986b; Gall & Evans, 1987). Examples of the latter include whether there is potential harm or benefit to his/her commitments, values, goals, or physical wellbeing. Stressful appraisals can be manifest in the form of harm, loss, threat, or challenge (Lazarus & Folkman, 1984a). An appraisal of harm or loss implies that damage has already been done (Lazarus & Folkman, 1984a). Threat implies that there is a future potential for harm or loss (Lazarus & Folkman, 1984a). Challenge refers to events that have the potential to be mastered and for which there may be gain (Lazarus & Folkman, 1984a).

In secondary appraisal, the person evaluates whether anything can, and might be done to overcome or prevent harm (Folkman et al., 1986a). This includes evaluation of what coping strategies may be employed effectively, such as accepting the circumstances, attempting to alter the situation, seeking more information or delaying taking action (Folkman et al., 1986a). Secondary appraisal also includes an evaluation of what the outcome of such action would potentially achieve (Lazarus & Folkman, 1984a).

Given the dynamic nature of stress, reappraisal follows an earlier appraisal. Reappraisal is an adjustment to the appraisal that is based on new information, gained from the environment and/or the person (Lazarus & Folkman, 1984a).

Ongoing research has identified six components of appraisal; two related to primary appraisal and four to secondary appraisal (Lazarus & Smith, 1988). The two primary appraisal components include motivational relevance and motivational congruence. Motivational relevance refers to the personal significance of the transaction. This implies the extent to which the situation touches on issues in which the person has a stake, or those that affect personal goals and concerns (Frijda, 1987; Scherer, 1984; Smith & Ellsworth, 1985; Smith & Ellsworth, 1987). Motivational congruence refers to the extent to which the encounter is congruent with personal goals. Together, these two primary appraisal components will define the encounter as one of either potential harm or benefit (Lazarus & Smith, 1988).

Lazarus and Smith identify the four cognitive components of secondary appraisal as the following: accountability; problem-focused coping potential; emotion-focused coping potential; and future expectancy (Lazarus & Smith, 1988). Problem-focused coping is predominantly associated with one exerting a level of control and power in a particular situation (Lazarus & Folkman, 1984a; Scherer, 1984). Accountability relates to judgement about whom, if anyone is to blame for harm or threat. Accountability also includes whether a person deserves credit for a benefit (Lazarus & Smith, 1988). Emotion-focused coping refers to the possibility of altering the emotional state, which is triggered by threatening and/or harmful situations (Folkman & Lazarus, 1980; Folkman & Lazarus, 1985; Folkman et al., 1986b; Lazarus & Folkman, 1984a). Future expectancy relates to whether the psychological situation can be changed in order to make it more or less motivationally congruent (Lazarus & Smith, 1988).

Vulnerability is closely linked to cognitive appraisal, and is dependent on one's physical, psychological and social coping-resources (Lazarus & Folkman, 1984a). Vulnerability can occur when one's personal or environmental resources are deficient, specifically in the context of one's personal commitments being threatened (Lazarus & Folkman, 1984a). In general, the greater the value of the commitment for the person, the greater the vulnerability that the person will experience (Lazarus & Folkman, 1984a). However, the depth of commitment can also motivate the person towards taking positive action, and may sustain the person's level of hope regarding the circumstances (Lazarus & Folkman, 1984a).

3.3.1 Person Factors Influencing Appraisal

Two person characteristics that are important determinants of appraisal are commitments and beliefs (Lazarus & Folkman, 1984a). These influence appraisal in three ways: firstly, by determining what is important for wellbeing; secondly, by shaping the understanding of the event, as well as emotions and coping efforts. Thirdly, commitments and beliefs influence appraisal by providing the basis for understanding the outcome (Lazarus & Folkman, 1984a).

Lazarus and Folkman (1984a, p.80) define commitments as “an expression of what is important to people”. Examples include survival, health and dignity. Commitments substantially influence the choices people make and contain a key motivational quality (Lazarus & Folkman, 1984a). Commitments may guide people into or away from stressful situations and also influence cognitive appraisal through their impact on vulnerability (Lazarus & Folkman, 1984a).

Beliefs shape a person’s perception of his or her relationship to the environment. They may be primitive and thereby rest on premises that are not open to question or higher-order beliefs (Lazarus & Folkman, 1984a). Higher order beliefs are achieved by deductive reasoning through experience (Lazarus & Folkman, 1984a). Beliefs also determine how a person perceives a situation and what the possible outcome could be. They often operate at a level below awareness and only consciously impact at a point where there is loss or change of belief (Lazarus & Folkman, 1984a). Beliefs about personal control and existential beliefs are considered to be particularly relevant in stress theory (Lazarus & Folkman, 1984a).

In a stressful situation, the extent to which the person believes that he/she is able to control the environment and his/her response to the stressor, will influence his/her emotional reaction and ability to cope (Lazarus & Folkman, 1984a). Research suggests that appraising a situation as controllable is stress reducing (Lazarus & Folkman, 1984a). However, an appraisal of controllability can also heighten threat, if having control is either contrary to a preferred style or if it conflicts with other commitments and goals (Lazarus & Folkman, 1984a). For example, depending on the person’s preferred style, certain patients will actively seek knowledge about their condition or the treatment thereof, whereas others would prefer to let that knowledge reside with their healthcare provider. With regard to the latter, obtaining knowledge pertaining to his/her condition may exacerbate the patient’s level of stress.

Existential beliefs are general beliefs about the meaning and purpose of existence and may include faith in God, fate, or some higher power in the universe (Lazarus & Folkman, 1984a). In a similar way to commitments, existential beliefs enable people to create meaning, and thereby sustain coping efforts and maintain hope in difficult circumstances.

Commitments and beliefs can be brought together in a general overarching personality concept called the 'self' (Lazarus & Folkman, 1984a). Commitments and beliefs provide a backdrop against which situation factors are appraised and these factors may thus work interdependently to influence appraisal. An event that does not have a bearing on a person's commitments or beliefs will not result in an appraisal (Lazarus & Folkman, 1984a).

3.3.2 Situation Factors Influencing Appraisal

The properties of events that make them stressful have been the focus of much research. A substantial amount of work has been done in the arena of life-events research, where the level of stress of a particular life event, (e.g. death of a spouse, divorce, being fired, personal injury, or illness), is assigned a relative weight to reflect a population parameter (Fontana, Hughes, Marcus & Dowds, 1979; Holmes & Rahe, 1967; Lazarus & Folkman, 1984a; Rabkin & Struening, 1976). However, there remains great inter-individual variation in the perception and response of individuals to stressful events (Lazarus & Folkman, 1984a). Lazarus and Folkman (1984a) consider the properties of novelty, predictability, event uncertainty, temporal factors and duration, as situation factors that may influence an appraisal of threat, harm or challenge.

A novel situation, being one in which the person has no previous experience, will not result in an appraisal of threat, unless there is a previous association with harm or danger (Lazarus & Folkman, 1984a). Very few situations will be entirely novel, and even in the most novel situations, pre-existing systems of schematised and abstracted knowledge will be utilised in an effort to create understanding and meaning (Lazarus & Folkman, 1984a). Novelty may add to stress because of the uncertainty involved in interpreting the situation (Lazarus & Folkman, 1984a). In addition, although there may be sufficient general knowledge to understand the situation, this may be insufficient to enable adequate coping. Awareness of this coping deficit may also increase stress.

Findings in animal studies indicate a preference for predictable stimuli over unpredictable stimuli, even when the stimulus is noxious, such as an electrical shock (Badia, Culbertson & Harsh, 1973, cited in Lazarus & Folkman, 1984a; Badia, Harsh & Abbott, 1979, cited in Lazarus & Folkman, 1984a). However, the animal model is not considered adequate for understanding psychological stress in humans, as it does not take into account individual differences in the way a person understands or responds to the situation (Lazarus & Folkman, 1984a). Lazarus and Folkman (1984a) introduce the term 'event-uncertainty', in order to distinguish their cognitive model of research from animal models. Anecdotal observations from real-life events indicate that where there is maximum uncertainty, the event can be extremely stressful and may immobilise the coping processes as well as cause mental confusion (Lazarus & Folkman, 1984a).

Mahon and Casperson (1997) illustrate the potential influence of event uncertainty on the effect of cancer on the patient's life. One of the major concerns posed by cancer is that the patient cannot be sure, for an extended period of time, as to whether or not a cure has been effected. This problem encompasses a continuous, unremitting situation of uncertainty about potentially negative and poorly predictable future events, rather than a single event or a series of events well marked in time (Mahon and Casperson, 1997).

Imminence, duration and temporal uncertainty are time-related factors that may influence appraisal and coping. In general, the appraisal becomes more urgent and intense, the nearer at hand an event (Lazarus & Folkman, 1984a). The greater the passage of time, the more complex the appraisal process becomes, but it can also allow one to manage the threat through cognitive coping (Lazarus & Folkman, 1984a).

The evidence regarding the influence of temporal uncertainty (not knowing when an event will occur) is limited. Research has indicated that although situations where there is temporal uncertainty are initially more threatening, they initiate a pattern of coping (attention deployment) which in turn may lead to a lowering of the stress response (Lazarus & Folkman, 1984a).

Research on the effect of duration of stress has been largely influenced by Selye's concept of the General Adaptation Syndrome (GAS) (Selye, 1976). Selye's theory suggests that a persistent stressor leads to failure to cope adequately, exhaustion, and ultimately susceptibility to fatigue and illness (Selye, 1976). However, not every chronic stressors leads to exhaustion. Selye's theory will be considered in greater detail later in this chapter, in the context of adaptational

outcomes. Habituation can be understood in terms of a reduced stress response over time, when one is exposed to repeated stressors (Lazarus & Folkman, 1984a). Habituation has been demonstrated in animals, but is not well established in human research (Lazarus & Folkman, 1984a). Cognitive coping-skills, such as avoidance or distancing oneself physically or emotionally from the situation, may also allow the person to adequately manage a persistent stressor, such as chronic illness.

Ambiguity is another common factor that may influence coping with stressful situations. Anxiety is often associated with the uncertain nature of a threat, whether, when and where it may occur (Lazarus, 1990; Lazarus, Averill & Opton, 1970; Lazarus & Folkman, 1984a). Ambiguity can thus heighten threat through uncertainty, by limiting the individual's feeling of being in control of the situation (Lazarus & Folkman, 1984a). Alternatively, ambiguity can reduce threat by allowing alternative, more reassuring interpretations of a situation (Lazarus & Folkman, 1984a).

3.4 The Concept of Coping

According to the animal model of stress, coping mechanisms, which are initiated by emotions such as anger or fear in the face of life-threatening dangers, are learned survival behaviours (Lazarus & Folkman, 1984a). In the case of fear, a likely response would be escape or avoidance, whereas in the context of anger, an expected response may be confrontation or attack. In the psychoanalytic ego psychology model, coping is defined as "realistic and flexible thought and acts that solve problems and thereby reduce stress" (Lazarus & Folkman, 1984a, p. 118). Cognitive processes may include denial, repression, suppression, intellectualization as well as problem-solving behaviours, which serve to reduce anxiety and other negative feelings (Lazarus & Folkman, 1984a; Menninger, 1963; Vaillant, 1977).

Folkman and Lazarus (1988a) suggest two major differences between the animal and ego psychology models:

1. The animal model focuses exclusively on behaviour whereas the ego model also focuses on thoughts (cognitions).
2. The primary objective of the animal model is survival, whereas the ego psychology model includes a large range of adaptive outcomes such as psychological well-being, physical health and social functioning.

Emotions depend on cognitive appraisals regarding the meaning of the person-environment relationship for the individual's wellbeing, as well as possible options for coping with the situation (Lazarus, 1982; Lazarus & Folkman, 1984a; Lazarus, Kanner & Folkman, 1980). These models in which coping affects emotion by either motivating or impeding it, are unidirectional, and underestimate the complexity and multidimensional nature of the coping process (Folkman & Lazarus, 1988b).

Also, emotion and coping are characterized by a high degree of variability among and within persons (Epstein, 1980; Folkman & Lazarus, 1980; Folkman & Lazarus, 1985; Folkman et al., 1986b; Menaghan, 1982). Folkman and Lazarus (1980) postulated a model that is bi-directional, with emotion and coping, each affecting one-another. Coping can thus be conceptualized as being either a dependent or an independent variable, depending on the circumstance. Lazarus and Folkman's model proposes that the process begins with a transaction that is appraised as harmful, beneficial, threatening, or challenging, thereby generating emotion. The appraisal and emotions influence the coping processes, which in turn alter the person-environment relationship. This leads to a second appraisal with a consequent change in emotion. Coping is thus viewed as a mediator of the emotion response (Lazarus & Folkman, 1980). This theoretical model was tested in a retrospective study, which evaluated the extent to which eight forms of coping mediated each of four sets of emotion (Folkman & Lazarus, 1988b). "Coping was associated with changes in all four sets of emotion, with some forms of coping associated with increases in positive emotion and other forms with increases in negative emotions" (Folkman & Lazarus, 1988a, p. 1).

Measurement approaches that assess coping traits and styles, for example type A and B personality, generally assume that coping is primarily a property of the person, and that variations in the stressful situation are of relatively little importance (Folkman et al., 1986a). However, the context of the situation is critical in the process-orientated approach because of the complexity and variability of the actual coping process (Folkman et al., 1986a). Consequently, the trait and style approach will not accurately predict the ways in which a person will actually cope in a stressful situation. There is evidence that personality traits do not in fact predict stress and adaptational outcomes as well as the process variables of appraisal and coping (Folkman & Lazarus, 1985; Folkman et al., 1986b; Larsson, 1989; Larsson, Kempe & Starrin, 1988).

The concept of coping should not be confused with automatized adaptive behaviour, since coping implies purposeful effort (Lazarus & Folkman, 1984a). An example of an automatized response that requires minimal effort, is an experienced driver who is not ordinarily conscious of using the clutch and brake. It should be acknowledged that as time progresses, much coping behaviour might become automatic.

Coping should also be viewed as efforts to manage stressful demands regardless of the outcome (Lazarus & Folkman, 1984a). The coping behaviour should be considered in the context of the situation and should not be judged in terms of the outcome, as being inherently better or worse than any other coping strategy. Effective coping should be considered that which allows the person to tolerate, minimise, accept or ignore that which cannot be entirely mastered (Lazarus & Folkman, 1984a).

The Coping Process

Lazarus and Folkman (1984a) define coping as “constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141). This definition is process rather than trait orientated as it implies a dynamic and ongoing encounter that changes and unfolds over time, and is also concerned with what the person actually thinks and does during such an encounter. A distinction is made between two general types of coping (Carver, Weintraub & Scheier, 1989). The first is ‘problem-focused coping’, and is aimed at managing the problem (Carver et al., 1989). The second, ‘emotion-focused coping’, attempts to regulate the emotional response to the problem (Carver et al., 1989). Both types of coping are usually present in a stressful encounter. Problem-focused coping tends to predominate when the person feels that something can be done, whereas emotion focused coping generally predominates when the person feels that the stressful situation has to be endured (Folkman & Lazarus, 1980)

Lazarus and Folkman (1984a) propose that the way a person copes is determined in part by the following factors: personal and environmental resources, including health, energy levels, material things and social support; existential beliefs; commitments (motivational); problem-solving skills, and social skills. Constraints such as internalized cultural values and beliefs may mitigate against using resources for coping (Lazarus & Folkman, 1984a). High levels of threat may impede the use of appropriate and effective coping skills, in particular problem-focused skills (Lazarus & Folkman, 1984a).

Research over the past 30 years has been divergent in terms of emphasis. Some models have emphasized coping by a person situated in a particular stressful encounter (Lazarus, 1966; Lazarus & Folkman, 1984a; McCrae, 1984). Other models have emphasized coping with a stressful condition (Pearlin, Lieberman, Menaghan & Mullin, 1981; Pearlin & Schooler, 1978). These studies have also given different weight to the influence of antecedent factors such as personality, individual and social resources as well as development over the lifespan (Aldwin, 1994; Holahan & Moos, 1986; Holahan & Moos, 1987; Holahan & Moos, 1990; McCrae & Costa, 1986; McCrae & John, 1992; Strack & Feifel, 1996).

Despite such variation in research emphasis, Folkman and Moskowitz (2000) suggest that findings converge in the following areas:

- “1. Coping has multiple functions, including but not limited to the regulation of distress and the management of problems causing distress.
2. Coping is influenced by the appraisal characteristics of the stressful context, including its controllability.
3. Coping is influenced by personality dispositions including optimism, neuroticism, and extraversion.
4. Coping is influenced by social resources” (Folkman & Moskowitz, 2000, p. 647).

3.5 Adaptational Outcomes and Adjustment

Prior to exploring Lazarus and Folkman’s view of adjustment, it is useful to introduce Selye’s concept of stress and the General Adaptation Syndrome (GAS). Selye’s theory is based on data from many animal studies, and conceptualizes the body as responding to environmental factors called stressors, in the following manner (Selye, 1976):

1. In the first phase, namely the Alarm Phase, the body is mobilized to meet the present threat and prepares the individual to fight or flee.
2. In the Resistance Phase, the body attempts to cope with a threat that cannot be avoided.
3. During the final stage, the Exhaustion Phase, the body is overwhelmed, as its resources are depleted. The body then becomes vulnerable to fatigue, physical problems and eventually illness.

Selye (1976) also observed that various factors, which may be either of a positive or negative nature, have the potential to mediate stress. However, the focus of Selye's theory is the biological responses that result from a person's attempt to adapt to the environment, and can be represented diagrammatically as follows:

"Stressor → Physiological stress reaction → Illness or healthy adaptation"

(Wade & Tavaris, 1996, p. 521)

More recent studies have found that this correlation is not direct and is also dependent on qualities of the individual, such as personality traits and perceptions (Wade & Tavaris, 1996). This is analogous to Lazarus and Folkman's theory of commitments and beliefs shaping a person's appraisal and coping strategies. Lazarus and Folkman's "Specificity Model of Illness" evaluates individual factors that lead to specific outcomes and specific illnesses, as opposed to the "Generality Model of Illness" as proposed by Selye (Wade & Tavaris, 1996).

Lazarus and Folkman view adjustment according to the following three dimensions: social functioning; morale; and somatic health (Lazarus & Folkman, 1984a). Social functioning is the manner in which the person fulfills his or her various life-roles, (such as parent, spouse, and employee), and may also be viewed in terms of health of interpersonal relationships (Lazarus & Folkman, 1984a). Morale is an indication of the way a person feels about him/herself and his/her conditions of life (Lazarus & Folkman, 1984a). Although the link between stress and illness is a widely held view, the evidence in support of this is not necessarily concrete. There has been substantial controversy as to whether there is generality or specificity in the relationship between stress and somatic illness (Lazarus and Folkman, 1984b). Studies of coping indicate that certain styles may be related to specific health outcomes. Ineffective management of anger for example, has been implicated in hypertension (Lazarus & Folkman, 1984b). The relationships between morale, social functioning and somatic health are complex and may involve trade-offs (Lazarus & Folkman, 1984a). Further research is required in this area.

3.6 The Application of Lazarus and Folkman's Theory to Chronic Disease Research

Lazarus and Folkman's theory of stress, appraisal and coping has been used widely in studies to examine the relationship between stress and chronic disease. Such diseases include the following: chronic obstructive pulmonary disease (Anderson, Dowds, Pelletz, Edwards & Peeters-Asdourian, 1995); bone-marrow transplant recipients (Widows, Jacobsen & Fields, 2000); breast cancer (Fridfinnsdottir, 1997; Reynolds, Hurley, Torres, Jackson, Boyd & Chen, 2000); spinal

cord injury (Moore, Bombardier, Brown & Patterson, 1994); arthritis (Downe-Wambolt & Melanson, 1998; Smith & Wallston, 1992); urinary incontinence (Valerius, 1997); low back pain (Turner, Clancy & Vitaliano, 1987); testicular cancer (Ord-Lawson & Fitch, 1997); colon cancer (Galloway & Graydon, 1996); HIV seropositive men and women (Anderson et al., 1995); osteoarthritis (Downe-Wambolt, 1991); and recurrent cancer (Mahon & Casperson, 1997).

While Lazarus and Folkman's theory (1984a) has been applied extensively in the context of various chronic diseases, to the author's knowledge, there is only one study that has considered pain intensity in chronic pain patients. The latter study was published in 1987 by Turner et al., and focused predominantly on the low back pain patient's perception of his/her primary stressor. There thus appears to be an absence of recent research that has explored the application of Lazarus and Folkman's theory to the relationship between stress, appraisal and coping-methods respectively with pain intensity, within a general chronic pain population.

3.7 Conclusion

Contextual models of stress are viewed as being both relational and process orientated. There is a relationship between the person and his/her environment, for which both person factors and the context of the stressful encounter for the individual have a bearing. Stress is considered a process as it entails change and dynamic interactions over a period of time. Lazarus and Folkman (1984a) have developed a model that provides a framework for the stress process, which includes the concepts of appraisal, coping and adjustment (adaptation). While Lazarus and Folkman's model (1984a) has been applied reasonably extensively to various chronic diseases, there is a paucity of research in its application to chronic pain.

CHAPTER FOUR:

THE RELATIONSHIP BETWEEN CHRONIC PAIN AND STRESS, APPRAISAL AND COPING STRATEGIES

4.1 Introduction

Research has established a link between stress and disease that can be indirect or direct (Bishop, 1994). The development of disease may be influenced indirectly through the person's health or illness behaviour (Adler & Matthews, 1994; Bishop, 1994). Poorer health habits may be practiced under conditions of increased stress or the person may ignore initial symptoms of illness and delay seeking timely help (Bishop, 1994). People under stress often change their eating, drinking and smoking habits (Bishop, 1994; Conway, Vickers, Ward & Rahe, 1981; Newcomb & Harlow, 1986). Poorer health outcomes can be the consequence of such changes in health behaviour (Leiker & Hailey, 1988; Wiebe & McCallum, 1986). Adherence to advice concerning health screening and medical treatment may also be negatively affected by stress processes (Anderson, Kiecolt-Glaser & Glaser, 1994).

Physiological functioning may be directly affected by stress through its impact on the autonomic nervous system, the endocrine system and the immune system (Bishop, 1994). Activation of the sympathetic nervous system results in an increase in heart and respiratory rate, an increase in blood flow to certain muscles, and conversion of stored energy to usable energy. Pain is perceived by the body to be stress, and the sympathetic nervous system is thus activated. In the context of chronic pain, aspects of sympathetic nervous system functioning may alter due to the consistent presence of the stressor. The endocrine system is also activated in the presence of stress, resulting in the adrenal medulla releasing large quantities of adrenaline and noradrenaline, and the adrenal cortex releasing corticosteroids. The synergistic activity of the sympathetic nervous system and adrenal medulla is termed the *sympathoadreno-medullary system* (Bishop, 1994).

There is growing evidence that stress affects the immune system by suppressing immune function at both a humoral and cell-mediated immunity level (Bishop, 1994). This increases susceptibility to bacterial and viral infection and provokes inflammatory episodes in auto-immune disorders (Baum, Newman, Weinman, West & McManus, 1997; Bishop, 1994; Cohen & Williamson, 1991). Certain chronic pain conditions, such as Systemic Lupus Erythematosus, are considered to be auto-immune disorders.

In light of that noted above, it could be deduced that stress does play a role either in the aetiology or as a contributing factor to various diseases. In Chapter Three, the author indicated various research findings pertaining to the association between Lazarus and Folkman's theory of stress, and its application to various chronic diseases. Additional examples of research findings pertaining to the relationship between stress and medical conditions include peptic ulcers, asthma, various cancers, cardiovascular disease, acute pain and chronic pain (Baum et al., 1997; Bishop, 1994; Linton, 2000; Melzack, 1999).

4.2 Stress and Chronic Pain

In this chapter, the relationship between the stress process, (stress, appraisal, coping and adjustment), and chronic pain is reviewed. The concepts of appraisal and coping have been extensively evaluated in relation to chronic pain (Boothby, Thorn, Stroud & Jensen, 1999; Jensen et al., 1991; Turner, Romano & Karoly, 1991). Although the terminology and definitions utilised are similar to those defined by Lazarus and Folkman (1984a), there are some important differences. These differences in definition will be introduced.

One of the purposes of this growing body of research, which uses models of stress, appraisal and coping, is to help explain the differences in adjustment found among persons who experience chronic pain (Jensen et al., 1991). The research has focused on examining the relationships between beliefs (appraisals) and coping strategies, and their ability to predict adjustment, as these may be important factors in determining cognitive-behavioural methods that can be employed to improve long-term adjustment to the chronic pain experience (Jensen et al., 1991).

4.2.1 Definitions

Jensen, Turner and Romano (1992) reviewed the literature on the relationship between chronic pain and appraisal, coping and adjustment. In this review, the basic concepts of stress, beliefs, coping and adjustment are defined in accordance with Jensen et al.'s (1992) conceptualisation of these variables. These definitions are similar to those indicated by Lazarus and Folkman's theory of stress.

Stress

Lazarus and Folkman (1984a) define stress as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (p. 19). This definition has been widely adopted as it incorporates the multiple factors that are believed to influence the stress process.

Beliefs and appraisal

Pain-beliefs are defined as “the cognitions (thoughts) that patients have regarding their pain problem” (Jensen et al., 1991, p.250). These are hypothesised to influence adjustment by directly impacting on the person’s mood and indirectly through their influence on coping efforts (Bandura, 1986, cited in Jensen et al., 1991). The term ‘beliefs’ is often employed in the literature and may not always directly match the concept of appraisal as defined by Lazarus and Folkman. Lazarus and Folkman (1984a) define appraisal as determining the personal significance of an event for a person in terms of his/her well being, and is shaped by beliefs and commitments.

Coping

Coping is defined as the purposeful effort to manage or minimize the negative impact of stress (Burish & Bradley, 1983; Jensen et al., 1991; Lazarus & Folkman, 1984a). Responses that are adaptive but which do not entail effort are not considered to be coping-responses (Lazarus & Folkman, 1984a). Coping strategies are divided into two major types: problem-focused-coping and emotion-focused coping (Lazarus & Folkman, 1984a). The concept of active and passive strategies is also used. Active strategies are those where the person has to initiate some approach to manage the pain experience whereas passive strategies involve withdrawal or giving up control (Brown & Nicassio, 1987).

Adjustment

Lazarus and Folkman (1984a) proposed three dimensions as being relevant to adjustment: social functioning, morale, and somatic health. A number of specific measures of adjustment to chronic pain have been considered to be potentially important. These include pain-behaviour, self-reported pain severity, activity level, physical strength, mobility, medication use, health services utilization, employment status and depression (Jensen & Karoly, 1992). Jensen and Karoly (1992) used factor analytic procedures to identify dimensions underlying these variables. Activity level, psychological functioning, and medication/professional services utilization were identified as three related, but distinct dimensions, of adjustment (Jensen & Karoly, 1992). The relationship

between chronic pain and adjustment will be inferred with respect to its application in the context of appraisal and coping. Research pertaining to the direct relationship between chronic pain and adjustment will, however, not be reviewed in this thesis.

4.2.2 The relationship between stress and chronic pain

Melzack's neuromatrix model of stress and pain, as indicated in Chapter 2, provides a physiological explanation for the link between stress and pain (Melzack, 1999). This model suggests the multidimensional nature of pain as being produced by neurosignature patterns of nerve impulses, generated from a neural network (Melzack, 1999). Output patterns of the neuromatrix activate perceptual, behavioural and homeostatic programs, following inputs that act on the neuromatrix (Melzack, 1999). The neuromatrix model considers that the pain perceptual system and stress system are intimately related and should be considered components of a single system (Melzack, 1999). The perceptual mechanisms incorporate mechanisms of the Gate Control Theory (Melzack & Wall, 1996). Activation of the stress-regulation system activates the hypothalamic-pituitary-adrenal system. The paraventricular nucleus of the hypothalamus produces corticotropin-releasing hormone, which activates the pituitary gland to produce adrenocorticotrophic hormone. This in turn acts on the adrenal cortex to produce cortisol (Melzack, 1999). The presence of increased levels of cortisol increases the susceptibility to developing pathology. The sympathetic system in the brainstem has descending and ascending projections that interact with immune, opioid and limbic-cortical systems (Melzack, 1999).

Stress has also been defined in terms of a state of threatened homeostasis where physiological or psychological stressors disrupt physiological processes (Chrousos, 1992). This disruption subsequently activates a host of programmes of neural, hormonal and behavioural activity, to reinstate homeostasis. Under conditions of prolonged stress, these programmes may become defective and result in a variety of stress-related disorders, which include several chronic pain syndromes (Chrousos, 1992; Chrousos & Gold, 1992; Sapolsky, 1996). It is thus postulated that stress may produce conditions that give rise to some forms of chronic pain.

Psychological factors contribute to the pain experience. Psychological stress results in increased cortisol levels, and the cumulative release of pulses of cortisol is a major determinant of pathology (Sapolsky, 1996). Chronic pain promotes an extended and destructive stress response, characterized by neuroendocrine dysregulation, fatigue dysphoria, myalgia and impaired mental

and physical performance (Chapman & Gavrin, 1999). In this context, stress is conceptualized as a dependent variable in the pain experience.

It is important to distinguish between stress as defined previously in this chapter and other commonly used terms, such as anxiety and emotional distress. During the stress response, a person may experience emotions such as anxiety and emotional distress. Emotional distress and anxiety may interact with various biological systems, (autonomic, visceral and skeletal activity), as part of the 'pain-anxiety-tension' cycle (Wall & Melzack, 1994). This cycle has been proposed to account for some forms of acute and chronic pain (Wall & Melzack, 1994). It has been observed particularly in disorders of the musculoskeletal system (Wall & Melzack, 1994). In a literature review of psychological risk factors in back and neck pain, a significant relationship was found between stress, distress, anxiety, and neck or back pain (Linton, 2000).

A stressor, such as a major life change generally initiates the stress process (Turner et al., 1987). Such stressors include the death of a spouse, loss of a job, major disasters (for example, an earthquake or floods), and daily stressful events (for example, work and family pressure) (Turner et al., 1987). There is, unfortunately, a relative paucity of data that examines the relationship between different types of stressors and pain.

The ability of a person to tolerate pain can be reduced by stressful events, and such stressors can also enhance or perpetuate pain (Sternbach, 1974; Wall & Melzack, 1994). Lazarus and Cohen (1977) consider three general classes of stressors: 1) cataclysmic phenomena (stressful events that affect a large number of people), analogous to major disasters 2) powerful events that challenge adaptive abilities (major life events such as loss of work or divorce) and 3) 'daily hassles'.

Life's daily hassles have been found to be strongly associated with increased chronic pain intensity (Affleck, Tennen, Urrows & Higgins, 1994; Penzien, Rains & Holroyd, 1993; Sternbach, 1986). Environmental stressors, such as family conflict and major life events, have been found to be more common among chronic low-back pain patients, (Feurstein, Salt & Houle, 1985; Leavitt, Garron and Bieliauskas, 1979; Merskey & Boyd, 1978). Environmental stressors have also been found to exacerbate certain kinds of pain (Affleck et al., 1994; Penzien et al., 1993). Stressful life events that arouse feelings of helplessness have been found to contribute to the development of chronic idiopathic low-back pain (Lampe, Sollner, Krismer, Rumpold, Kantner-Rumplmair, Ogon & Rathner, 1998). Ratings of greater life adversity have been found to

be related to high levels of pain, disability and depression in chronic low back pain patients (Klapow, Slater, Patterson, Hampton-Atkinson, Weickgenant, Grant & Garfin, 1995).

Research has identified both a direct and an indirect relationship between chronic pain and stress (Jensen, Turner, Romano & Lawler, 1994). Significant direct relationships have been demonstrated between the experience of stress and both the incidence as well as the severity of painful conditions (Fisher, Cooper, Weber & Liao, 1996; Holmstrom, Lindell & Moritz, 1992). Geisser, Robinson & Henson (1994a) found the pain–experience to contribute positively to pain related stress in persistent pain patients. Stress may also be indirectly related to chronic pain via the common consequences of chronic pain such as the loss of a job or marital problems (Jensen et al., 1994). The complex relationship between stress and pain can thus be seen a to be bi-directional in nature, with stress being either a dependent or an independent variable, depending on the context.

In a comparative study to evaluate the pain threshold in healthy versus neurasthenia (chronic emotional stress) patients, neurasthenia patients showed a reduction in their pain threshold (Ashkinazi & Vershinina, 1999). It was postulated that the reduced pain threshold could be due to a reduction in the brain's opioid system, resulting in a weakening in descending tonic inhibition during long-term psycho-emotional stress (Ashkinazi et al., 1999). This study provides an example of a direct effect of stress on pain intensity, with stress being an independent variable.

4.2.3. Conclusion

There is a scarcity of data that evaluates the relationship between chronic pain and stress per se. The stress-regulatory system is activated in the context of pain and reflects the physiological link with the pain experience. The relationship between pain and stress may be both direct and indirect. This association is evidenced by research findings indicating that stress can play a role in contributing towards the pain experience, as well as being a consequence thereof. The association between the stress process and pain has been most extensively investigated in terms of appraisal and coping, since appropriate psychobehavioral intervention may lead to better adjustment. These relationships will thus be explored in further detail.

4.3 Chronic Pain and Appraisal

Jensen et al. (1991) reviewed much of the research on chronic pain and beliefs performed prior to 1991. The conclusions of Jensen et al.'s (1991) review indicate various trends, which will now be presented. Firstly, patients that have a more internal locus of control and believe they have control over their pain have indicated better adjustment. Secondly, locus of control has been shown to possibly mediate the relationship between pain severity and depression. Thirdly, 'cognitive errors', especially catastrophising, appear to be related to both psychological and physical dysfunction, and may predict long-term adjustment to chronic pain. The fourth conclusion reflected in the review is that self-efficacy expectancies influence the use of coping strategies and adjustment (Jensen et al., 1991). For the purposes of the review, catastrophising is discussed as a coping strategy and not as an appraisal.

The goal of this review is to provide research findings subsequent to those noted by Jensen et al. (1991). Recent research has identified the pain appraisals of locus of control, pain-specific beliefs, (especially disability), and self-efficacy as being particularly relevant to adjustment to chronic pain (Gibson & Helme, 2000; Kuile, Spinhoven, Linssen & van Houwenlingen, 1995). These appraisals are in accordance with Jensen et al.'s review (1991) and will be discussed in greater detail.

4.3.1 Locus of Control

It has been proposed that the extent to which a person believes that he/she is able to control both the environment and his/her response to a stressful situation, will influence his/her emotions and methods of coping (Lazarus & Folkman, 1984a). Perception of self control assesses the degree to which an individual believes that his/her health or severity of pain is determined by factors of chance, by actions of powerful others (e.g. family members, doctors or other health professionals), or are a consequence of his/her own actions. Individuals who display an external locus of control believe that situations are controlled largely by powerful others or chance, while individuals who display an internal locus of control emphasize responsibility for their own choices and behaviour (Gibson & Helme, 2000).

In a sample of 51 patients with chronic pain of myofascial origin, the relationship between a dispositional measure of coping, the internality dimension of the Pain Locus of Control (PLOC) Scale, and ratings of pain intensity, frequency and pain-related behavioural functioning were investigated (Toomey, Mann, Abashian & Thompson-Pope, 1991). Patients above the median on

the internality dimension of the PLOC Scale reported their pain to be less intense and frequent as compared to those below the median. These results were found to be consistent with previous research (Toomey et al., 1991). An association between the PLOC and changes in both the intensity and frequency of pain can thus be identified. Toomey et al. (1991) further postulate that strategies, which provide reduction in pain intensity and frequency, might be expected to result in increased perception of personal control of pain. This hypothesis was confirmed in a study, which evaluated the relationships between the Coping Strategies Questionnaire (CSQ) subscales and pain adjustment, while controlling for selected variables (Geisser et al., 1994a). Perceived ability to control and decrease pain was related to better adjustment (Geisser et al., 1994a).

Chronic pain patients with a predominantly internal locus of control reported decreased pain intensity, less mood disturbance, use of more active coping strategies and better compliance with treatment protocols (Gibson & Helme, 2000). On the other hand, patients with an external locus of control reported greater pain, increased incidence of depression and the use of maladaptive coping strategies, specifically catastrophising (Gibson & Helme, 2000).

Gibson and Helme evaluated PLOC in 161 older patients to explore age related difference in PLOC orientation and adjustment (Gibson & Helme, 2000). An internal PLOC orientation was positively related to the use of coping self-statements, increased behavioural activities, and self-rated ability to control or decrease pain. High internal locus of control was also associated with lower levels of pain, fewer depressive symptoms, less catastrophising and a decrease in perceived interference from pain. A powerful other (external) locus was related to an increased use of praying and hoping. Chance or external PLOC was accompanied by increased catastrophising, a reduced ability to decrease pain and greater self-rated interference from pain (Gibson & Helme, 2000).

In summary, perceptions of control have proved to be an important cognitive parameter that impacts a number of aspects of the pain experience. As a group, these studies indicate that belief in ability to control pain is consistently related to the use of active coping-strategies and better physical and psychological adjustment. Physical adjustment is associated with decreased pain intensity and less interference from pain in one's daily life. Psychological adjustment in this context is associated with less mood disturbance. In contrast, patients who displayed a more external locus of control utilized more maladaptive coping strategies, such as catastrophising, had a reduced ability to control pain and greater risk of depression.

4.3.2 Pain Specific Beliefs

Pain-specific beliefs have been hypothesized to be important in determining adjustment to the chronic pain experience (Kuile et al., 1995). Williams and Thorn (1989) developed a questionnaire called the Pain Beliefs and Perceptions Inventory (PBAPI). The PBAPI measures three aspects of a patient's belief about his/her chronic pain: 'Time', 'Mystery' and 'Self blame'. 'Time' is defined as the belief that pain will be an enduring aspect of the patient's life. 'Mystery' is defined as the belief that pain is mysterious and a poorly understood phenomenon, and 'Self blame' is defined as the belief that pain is caused by or maintained by the patient (Williams & Thorn, 1989; Williams & Keefe, 1991). Keefe and Williams (1990) evaluated whether these specific beliefs related to the use and perceived effectiveness of cognitive and behavioural coping strategies in chronic pain patients. The results indicated that patients belonging to the group characterized by the belief that pain was enduring and mysterious were less likely to use adaptive coping strategies, such as reinterpretation of pain sensations, as compared to patients who believed their pain to be understandable (Keefe & Williams, 1990). The patients who believed their pain to be enduring were also more likely to catastrophise and less likely to rate their coping strategies as being effective in controlling and decreasing pain (Keefe & Williams, 1990).

Jensen and Karoly (1992) examined the association between beliefs about chronic pain and adjustment, in a sample of 118 chronic pain patients. A particularly salient finding was that those patients who believed themselves to be disabled by their pain, demonstrated significantly lower levels of activity and psychological well being, as well as higher levels of professional services utilization (Jensen & Karoly, 1992). The relationship between a disability belief and activity level varied as a function of pain severity with the association being the strongest among those with medium levels of perceived pain (Jensen & Karoly, 1992). Believing in a medical cure for pain was also positively related to professional service utilization (Jensen & Karoly, 1992). An expressed belief in the appropriateness of solicitous responses from family members was negatively related to psychological functioning for patients reporting relatively low levels of pain (Jensen & Karoly, 1992). These findings support the hypothesis that illness beliefs influence multidimensional pain adjustment, and in particular the belief concerning whether or not one is disabled by pain. It should, however, be noted that these beliefs are not necessarily a direct correlate and can be moderated by perceived pain severity (Jensen & Karoly, 1992).

Jensen et al. (1994) examined the relationship between pain-specific beliefs and adjustment to chronic pain in a sample of 241 chronic pain patients. The beliefs that emotions affect pain, that others should be solicitous when the patient experiences pain, and that one is disabled by pain (low to medium levels of pain severity) were associated positively with psychosocial dysfunction (Jensen et al., 1994). The beliefs that one is disabled and that activity should be avoided because pain signifies damage to the body were associated positively with physical disability (Jensen et al., 1994).

The relationship between pain beliefs and patient functioning and behaviour was assessed in 121 chronic pain patients (Jensen, Romano, Turner, Good & Wald, 1999). The assessment was based upon self-report by the patient and also included spouse report and direct observation. Patient beliefs about pain were strongly related to pain behaviours and functioning, thereby confirming previously reported results in this regard (Jensen et al., 1999). Significant associations were also found based upon spouse and observer reported frequency of pain behaviours, although to a lesser extent than that reported by the patient (Jensen et al., 1999).

In summary, negative pain beliefs, such as believing that one is disabled by pain and that pain is mysterious, are associated with the use of maladaptive coping strategies as well as poorer psychosocial and physical adjustment.

4.3.3 Self-Efficacy

A self efficacy appraisal has been defined as a belief about one's ability to perform a specific behaviour (Jensen et al., 1991). It is suggested that individuals will engage in coping efforts that they believe they are capable of undergoing, and that will result in a positive outcome (Jensen et al., 1991). This appraisal is likely to be closely linked to self-efficacy coping strategies, such as ability to decrease and control pain. A number of studies have examined the influence of self-efficacy and its relationship to coping and adjustment in patients with chronic pain (Anderson et al., 1995; Jensen et al., 1991; Lin, 1998; Lin & Ward, 1996; Strahl, Kleinknecht & Dinnel, 2000).

One hundred and fourteen chronic pain patients completed measures of health-related dysfunction, pain severity, use of eight coping strategies and their outcome, as well as self-efficacy expectancies regarding these coping strategies (Jensen et al., 1991). Patient's beliefs about their capabilities were strongly related to the self-reported use of coping efforts, after controlling for self-reported pain intensity (Jensen et al., 1991). Even when beliefs about the

outcome of the coping strategies were controlled for, significant relationships were found (Jensen et al., 1991).

The roles of self-efficacy and outcome expectancies in coping with chronic low back pain were evaluated in 85 chronic low back pain patients (Lin & Ward, 1996). Pain intensity was inversely related to patient's self-efficacy to cope with pain. Both self-efficacy and outcome expectancies were positively associated with perseverance of coping effort (Lin & Ward, 1996).

Lin (1998) evaluated the relationship between self-efficacy for attenuating pain and pain outcomes in eighty-five patients with chronic low back pain and eighty-eight patients with chronic cancer pain. For both groups of patients, perceived self-efficacy was significantly inversely correlated with pain intensity and pain interference with daily life (Lin, 1998).

Strahl et al. (2000) performed a study on 154 rheumatoid arthritis patients, to examine the relationship between pain anxiety dimensions, use of active and passive coping-strategies and self-efficacy as predictors of functional status. Data from this research supports previously established findings of self-efficacy contributing to physical, social, emotional and role functioning in chronic rheumatoid arthritis patients (Strahl et al., 2000).

In summary, research findings indicate that self-efficacy beliefs positively influence both coping and adjustment in chronic pain patients in a number of important areas, including physical, emotional and psychosocial functioning.

4.3.4 Conclusion

The research subsequent to Jensen et al.'s review (1991) supports their initial findings and provides further evidence that appraisal is important in predicting adjustment to chronic pain. Patients who believe they can control their pain, who avoid catastrophising about their condition, and who believe they are not severely disabled by their pain show better physiological and psychological adjustment. Some of these beliefs appear to play a role in mediating the relationships between pain severity and adjustment and also influence whether adaptive or maladaptive coping strategies are utilized.

4.4 Coping and Chronic Pain

The review by Jensen et al. (1991) also evaluated literature on the relationship between chronic pain and coping. The key findings of this review are presented as they have provided relevant focus and direction to chronic pain and coping research. More recent studies will then be reviewed.

4.4.1 Initial Findings in Coping and Chronic Pain Research

Three key measurement tools have been used for measuring the multidimensional aspects of coping with chronic pain: the Vanderbilt Pain Management Inventory (Brown & Nicassio, 1987); the Coping Strategies Questionnaire (Rosenstiel & Keefe, 1983); and the Ways of Coping Checklist (Lazarus & Folkman, 1984a). These three assessment tools and relevant findings pertaining to their use in chronic pain research will be presented.

The Vanderbilt Pain Management Inventory (VPMI) comprises 18 questions to assess both active and passive coping strategies (Brown & Nicassio, 1987). Active strategies, such as exercise and ignoring pain, require the patient to take personal responsibility for his/her methods of coping, and are considered to be adaptive (Brown & Nicassio, 1987). Passive strategies involve withdrawal and giving responsibility to an external source. These strategies are considered to be maladaptive (Brown & Nicassio, 1987).

According to the author's knowledge, relatively few studies have been conducted using the VPMI. Both cross-sectional and longitudinal analysis (over 6 months) found active coping to be inversely associated with depression and physical disability (Brown & Nicassio, 1987). However, passive coping was associated positively with poorer outcomes only in those patients reporting high levels of pain (Brown & Nicassio, 1987). This may indicate that pain severity has a moderating influence on the outcome of coping activities.

The Coping Strategies Questionnaire (CSQ) contains 42 items that assess eight coping strategies: Diverting Attention; Reinterpreting Pain Sensations, use of Coping Self-Statements, Ignoring Pain Sensations, Praying or Hoping, Catastrophising, Increasing Activity Levels and Increasing Pain Behaviour (Rosenstiel & Keefe, 1983). Two additional items on the questionnaire rate the patient's perceived ability to control and decrease his/her pain (Rosenstiel & Keefe, 1983). Lawson, Reesor, Keefe and Turner (1990) proposed that the CSQ has three underlying components, namely conscious cognitive coping (ignoring pain and coping self-statements), self-

efficacy belief factors (ability to control and decrease pain) and pain avoidance (diverting attention and praying and hoping).

Much of the research covered prior to 1991 included composite analysis and largely excluded analysis of the subscales of the CSQ. In the majority of the 12 studies that evaluated conscious cognitive coping and adjustment (pain severity and psychological functioning), no significant relationships were found (Jensen et al., 1991). A consistent relationship emerged with self-efficacy belief factors, with findings indicating a significant inverse relationship between these factors and pain intensity, physical disability and psychological dysfunction (Jensen et al., 1991). No consistent pattern emerged between the Pain Avoidance category and psychological functioning, physical disability or pain intensity (Jensen et al., 1991).

The Ways of Coping Checklist (WCCL) is based on Lazarus and Folkman's (1984a) model of stress (Vitaliano, Russo, Carr Maiuro & Becker, 1985). The WCCL has subsequently been submitted to a factor and item analysis, which identifies five coping strategies: Problem-Focused, Self-Blame, Avoidance, Wishful Thinking and Seeks Social Support (Vitaliano et al., 1985). In the period covering Jensen et al.'s review (1991), five studies evaluated the relationship between the WCCL and adjustment to chronic pain. In general, these studies indicate an association with factors on the WCCL and both psychological and physical functioning (Jensen et al., 1991). However, it is difficult to draw conclusions regarding specific trends because of the use of subscales that are made up of different items being used in different studies.

In summary, Jensen et al. (1991) found various trends to be present in the coping and chronic pain literature. Active coping strategies were associated with better adjustment in terms of depression and physical disability, whilst passive strategies were associated with poorer outcomes. This relationship was moderated by pain severity (Jensen et al., 1991). Conscious cognitive coping, (ignoring pain and coping self-statements), was not associated with adjustment. Self-efficacy beliefs were found to be associated with lower pain intensity and better physical and psychological function. No consistent relationship was found with the pain avoidance category for any of the aspects of adjustment. Although coping strategies play an important role in adjustment to chronic pain; definitive conclusions are difficult to establish because of the inadequacy of experimental designs (Jensen et al., 1991). Such methodological inadequacies include confounding between predictor measures (appraisals and coping) and adjustment; not controlling for moderating factors, utilization of composite measures which do not reveal the

value of specific coping strategies, and lack of adequately validated measurement tools (Jensen et al., 1991).

Jensen et al.'s (1991) work has been important in identifying where the focus for coping research in the context of chronic pain should lie. The objective of the author is thus to provide an update on the research conducted subsequent to Jensen et al.'s (1991) review, in order to identify more recent key findings in the arena of coping and chronic pain.

4.4.2 Composite Analysis: More Recent findings in the Chronic Pain and Coping Research

Coping has been categorized along the dimensions of emotion-focused versus problem-focused (Lazarus & Folkman, 1984a), and passive versus active (Brown & Nicassion, 1987). In addition to the evaluation of these dimensions, some researchers have attempted to identify other underlying composite factors using factor analysis of the coping instruments. Composite dimensions combine numerous coping strategies into few composite measures, for example passive versus active coping. Despite Jensen et al.'s (1991) suggestion to evaluate specific coping strategies, composite analysis of coping strategies has continued. This can be explained by very large patient numbers being required to assess specific strategies, in order to avoid concluding that significant associations exist when they may have occurred by chance (Boothby et al., 1999). Also by reducing the number of variables in an analysis, composites can increase the power of statistical tests (Boothby et al., 1999).

A review of composite measures of coping and their relationship to adjustment is organized by type of measurement tool utilized, because these tools should essentially evaluate similar measures, making trends easier to identify. The three assessment tools that will be discussed include the Vanderbilt Pain Management Inventory (Brown & Nicassio, 1987); the Coping Strategies Questionnaire (Rosenstiel & Keefe, 1983); and the Chronic Pain Coping Inventory (Jensen, Turner, Romano & Strom, 1995).

4.4.2.1 Vanderbilt Pain Management Inventory

The VPMI and the CSQ were used to measure coping in patients with low back pain. Active coping was found to be related to increased uptime at a three-month follow-up but was unrelated to pain outcomes at six months (Spinhoven & Linssen, 1991).

Passive coping with pain in a group of 239 rheumatoid arthritis patients was measured using the VPMI over a four-year period. Passive coping was associated positively with psychosocial impairment and negatively with perceived quality of emotional support (Smith & Wallston, 1992). Active coping strategies were relatively unrelated to any of the outcome variables (Smith & Wallston, 1992).

4.4.2.2 The Coping Strategy Questionnaire

The CSQ is the most widely used measurement tool in coping and chronic pain research (Swartzman, Gwadry, Shapiro & Teasell, 1994). Various studies evaluated the relationship between the dimensions (composite scores) of the CSQ and adjustment, while other studies have evaluated and revised the factors and subgroups of the CSQ (Riley, Robinson & Geisser, 1999; Swartzman et al., 1994).

In a study in rheumatoid arthritis patients, the use of active coping (VPMI) and those who used adaptive coping (CSQ, Coping Self-Statements) was associated with better affect (Zautra, Burleson, Smith, Blalock, Wallston, DeVellis, DeVellis & Smith, 1995). Those who used catastrophising (CSQ) and passive coping (VPMI) strategies reported poorer affect. Maladaptive strategies were more likely to be used in those patients experiencing greater pain intensity and pain-related dysfunction (Zautra et al., 1995).

Using the CSQ and VPMI, the relevance of active and passive coping strategies as dimensions in chronic pain was evaluated in 210 chronic pain patients (Snow-Turek, Norris & Tan, 1996). The study found that passive coping correlated positively with psychological distress and depression, whereas active coping correlated positively with activity level and was inversely related to psychological distress. The CSQ was found to be a more psychometrically sound measure of active and passive coping than the VPMI (Snow-Turek et al., 1996).

Factor analysis of the CSQ revealed a five-factor structure that was found to be more interpretable than the original CSQ. The revised CSQ included the factors of 'Distraction', 'Ignoring Pain Sensations', 'Reinterpreting Pain Sensations', 'Catastrophising' and 'Praying and Hoping' (Swartzman et al., 1994). The latter four factors correspond with parallel subscales proposed in the original CSQ. The fifth subscale, 'Distraction' is comprised of items from both the 'Diverting attention' and the 'Increasing Activity Level' subscales. This indicates that cognitive and behavioural distraction comprises a single strategy (Swartzman et al., 1994). The

'Increasing Pain Behaviour' and the 'Coping self Statements' subscales failed to reliably measure distinct coping strategies (Swartzman et al., 1994). While the revised CSQ certainly holds potential promise, further research is still necessary in order to validate this instrument.

4.4.2.3 Chronic Pain Coping Inventory

A more recently developed questionnaire, the Chronic Pain Coping Inventory (CPCI) which comprises 104 items that measure coping strategies frequently used in pain treatment programmes, was developed and provisionally validated (Jensen et al., 1995). Four scales ('Guarding', 'Resting', 'Asking for Assistance', and 'Task Persistence') predicted both patient adjustment as well as a significant other's report of the patient's adjustment. Eight scales (Guarding, Opioid Medication Use, NSAID use, Sedative-Hypnotic Medication Use, Resting, Asking for Assistance and Exercise/Stretch) showed moderate-to-strong relationships between patient and significant other versions. The CPCI was also independently validated alongside the CSQ (Hadjistavropoulos, Macleod & Asmundson, 1999). The CPCI was found to measure conceptually different coping constructs than the CSQ. Even after taking into account the CSQ subscales, demographic and pain-related variables, several of the CPCI subscales were found to be significantly and uniquely related to adjustment to pain. This pain-coping measurement instrument represents further advances in pain coping research methodology. There is minimal data available regarding the use of the CPCI, and further research is thus necessary in order to validate this questionnaire.

In summary, negative outcomes in terms of pain and psychological adjustment were reported for those composites considered to be maladaptive, such as avoidance of pain, low perceived control over pain, catastrophising, and passive coping. Composites associated with better adjustment, included active coping strategies. While the CSQ is the most widely used measurement tool, the variety of subscales proposed is likely to make establishment of definitive conclusions, complex. Promising new measurement tools have been developed and future utilization in studies will determine their value.

4.4.3 Individual Coping Strategies

Jensen et al. (1991) highlighted the importance of evaluating specific coping strategies. This has been confirmed in studies which showed that individual scores of the CSQ provided more information than the composite measure regarding the relationship between coping and adjustment (Jensen et al., 1992). Individual scores may thus be more useful in identifying relevant

coping strategies for intervention (Geisser et al., 1994a). A substantial amount of research has been conducted in the period subsequent to Jensen et al.'s (1991) review and this work is presented according to specific coping-strategies.

4.4.3.1 Catastrophising

There has been some debate in the literature regarding whether catastrophising should be considered a coping strategy or an outcome (Jensen et al., 1991). Geisser et al. (1994a) found catastrophising to be a separate entity to depression. It has also been most extensively evaluated as a coping strategy as it represents one of the subscales measured in the CSQ. Catastrophising will therefore be reviewed in the latter context.

Geisser et al. (1994a) conducted a study on 152 chronic pain patients, in order to evaluate the conceptual overlap between coping and adjustment, and to determine the value of individual subscales versus composite analysis. The Pain Avoidance factor was positively related to adjustment, which included pain severity and pain interference (Geisser et al., 1994a). The Catastrophising subscale was positively related to negative affect, even when controlling for the level of depression. Lower levels of pain correlated with ability to decrease pain. The Praying/Hoping subscale seemed to account for the relationship between pain avoidance and adjustment (Geisser et al., 1994a). Better adjustment was related to the ability to control and decrease pain, and poorer adjustment was related to praying/hoping and catastrophising (Geisser et al., 1994a). This study indicates that the use of subscales may in fact be more useful than composite scores in identifying important coping strategies to target for intervention (Geisser et al., 1994a).

In a study in young adults, the CSQ was utilized to investigate the relationship between reported pain levels, concomitant pain problems and coping strategies utilized (Lefebvre, Lester & Keefe, 1995). Both pain level and concomitant pain problems were positively associated with catastrophising (Lefebvre et al., 1995). Patients reporting higher levels of catastrophising not only had higher levels of pain but also reported a higher frequency of both migraine headaches and low back pain (Lefebvre et al., 1995).

Studies which evaluated catastrophising, found it to be positively associated with psychological dysfunction (Geisser et al., 1994a; Geisser, Robinson, Keefe & Weiner, 1994b; Harkapaa, 1991; Hill, 1993; Jensen et al., 1992; Robinson, Riley, Myers, Sadler, Kvaal, Geisser & Keefe, 1997;

Ulmer, 1997), and the rate of psychosocial dysfunction (Hill, Niven & Knussen, 1995; Jensen et al., 1992). Poorer physical functioning and disability were also found to be positively associated with catastrophising (Hill et al., 1995; Martin, Bradley, Alexander, Alarcon, Triana-Alexander, Aaron & Alberts, 1996; Robinson et al., 1997). Research has also indicated a positive relationship between catastrophising and pain intensity (Geisser et al., 1994a; Geisser et al., 1994b; Harkapaa, 1991; Hill, 1993; Hill et al., 1995; Lefebvre et al., 1995; Robinson et al., 1997; Sullivan, Bishop & Pivik, 1995; Ulmer, 1997; Wilkie & Keefe, 1991). More reports of pain interference in daily activities (Geisser et al., 1994a; Lin & Ward, 1996; Robinson et al., 1997), lower levels of general activity (Robinson et al., 1997), and reduced ability to work (Lester, Lefebvre & Keefe, 1996), have also been shown to have a direct association with catastrophising as a coping strategy.

The majority of studies which have evaluated catastrophising, have found it to be significantly associated with maladjustment in nearly all areas of functioning, including physical, psychological, social and occupational. A positive association between catastrophising and pain intensity has been indicated by research findings. As catastrophising has the capacity to impact many aspects of adjustment, it should be considered an important coping strategy to target for therapeutic interventions.

4.4.3.2 Praying/Hoping

Dozois, Dobson, Wong, Hughes and Long (1996) found more frequent use of praying/hoping to be related to greater subjective disability and lower functional capacity. Keefe, Crisson, Urban and Williams (1990) found that Diverting Attention and Praying/Hoping explained a small, but significant variance in pain report in a group of chronic pain patients. Geisser et al., (1994a) found that Praying/Hoping correlated with more pain interference, increased pain severity and greater affective distress in a group of chronic pain patients. In one study, chronic pain patients were found to use religious coping in the form of both positive and negative strategies (Greene Bush, Rye, Brant, Emery, Pargament & Riessinger, 1999). Positive religious coping strategies were significantly associated with positive affect, after controlling for demographic variables. In contrast negative religious coping strategies were not significantly associated with outcome variables (Greene Bush et al., 1999).

Overall, some studies showed praying or hoping to be related to greater disability, pain severity, more pain interference in daily life and negative affect, in chronic pain patients (Boothby et al., 1999). In contrast, other studies have shown no relationship to a number of outcomes including

pain severity, psychological and social functioning, general activity and return to work (Boothby et al., 1999). An interesting exception was found in the case of positive religious coping, which revealed a proportional relationship with positive affect. In conclusion, praying/hoping appears to correlate with adjustment in certain settings but not in others.

4.4.3.3 Reinterpreting Pain Sensations

Some studies have shown that reinterpreting pain sensations as more pleasant (e.g. dull, warm feeling or tingling) resulted in reports of lower pain levels (Buckelew, Conway, Shutty, Lawrence, Grafing, Anderson, Hewett & Keefe, 1992; Kuile et al., 1995). Some research findings indicate that reinterpreting pain sensations contributed to greater perceptions of control over pain, after controlling for pain severity and education (Haythornwaite, Menefee, Heinberg & Clark, 1998). However, other studies have shown that higher rates of psychological and social dysfunction occur in those patients who utilize reinterpreting pain as a coping strategy (Hill et al., 1995; Jensen et al., 1992).

Boothby et al. (1999) found that overall, reinterpreting pain sensations was not associated with significant differences in most aspects of adjustment, such as physical disability, functional capacity, psychological and social functioning and pain severity.

4.4.3.4 Ignoring Pain

Ignoring pain predicted lower perceptions of control over pain in a group of chronic pain patients (Haythornwaite et al., 1998). This finding is in contrast to another study, which showed that greater use of ignoring pain was also associated with a greater rate of return to work at nine months (Dozois et al., 1996). Lower ratings of pain and higher levels of general activity were related to more frequent use of this strategy (Geisser et al., 1994a; Hill, 1993).

Despite the findings noted above, many studies have indicated non-significant associations with a number of outcome variables, including, pain interference with activities or ability to work, psychosocial dysfunction, psychological functioning or pain severity (Boothby et al., 1999). In the majority of cases, ignoring pain does not seem to represent an effective coping strategy for chronic pain patients.

4.4.3.5 Distraction/Diverting Attention

Among rheumatoid arthritis patients, greater use of distraction was found to be related to a more positive affect, but only for those patients experiencing lower levels of pain (Affleck, Tennen, Urrows & Higgins, 1992). Greater pain severity and higher levels of psychological distress were found in a group of phantom limb pain patients who used diverting attention from pain as a coping strategy (Hill, 1993). In a group of chronic pain patients, distraction was associated with increased pain severity and interference with daily activities (Robinson et al., 1997).

Most researches have failed to establish a significant relationship with the use of distraction and pain interference with daily activities, general activity level, disability, emotional distress or depression, psychosocial function, or pain severity (Boothby et al., 1999). While distraction may be useful in the acute pain setting, it does not appear to be particularly useful in the chronic pain context.

4.4.3.6 Positive Coping Self-Statements

In chronic pain patients, coping self-statements predicted greater perceptions of control over pain, even after controlling for pain severity and education (Haythornwaite et al., 1998). Hill (1993) found positive coping self-statements to be associated with lower levels of pain severity and less psychological distress.

A number of other studies found non-significant relationships with the use of coping self-statements and daily activities, disability, affective distress/depression, psychosocial dysfunction or pain severity (Boothby et al., 1999). The evidence for the usefulness of positive coping self-statements is thus equivocal. However, where differences do exist, they are more likely to be adaptive rather than maladaptive (Boothby et al., 1999).

In summary, since 1991 a substantial amount of work has been done to evaluate specific coping strategies. Only one coping strategy, catastrophising, has shown a strong and consistent negative influence on adjustment in nearly all areas. Research investigating the effectiveness of ignoring pain sensations, reinterpreting pain sensations and distraction/diverting as methods of coping with the chronic pain experience, yielded equivocal results. These coping strategies are thus not considered to be relevant for effective functioning in chronic pain patients. It should, however, be noted that in practice, these strategies might prove to be useful for some chronic pain patients. Although the evidence did not indicate a strong and consistent relationship for praying/hoping

and coping self-statements, these may play a role in certain settings. Praying/hoping may predict dysfunction or adjustment depending on whether positive or negative strategies are used. Positive coping self-statements tend to be adaptive.

4.4.4 Conclusion

Overall, research since 1991 has continued to provide evidence that coping plays an important role in adjustment to chronic pain. Research has taken essentially two avenues; evaluation and validation of composite scores of the coping measurement tools and evaluation of the relevance of individual coping strategies. In general, maladaptive strategies predicted poorer adjustment and adaptive strategies have tended to predict better adjustment. The majority of studies published subsequent to 1991, seem to have employed more rigorous methodology and controlled for confounding variables such as pain intensity, as compared to research performed prior to 1991. Catastrophising is an important coping strategy to target for therapeutic intervention. Praying/hoping and positive coping self-statements may also influence adjustment. Ignoring pain, distraction and reinterpreting pain appear not to be as relevant to the adjustment process of patients with chronic pain. The work to date has achieved some focus for chronic pain and coping research. Because of the extensive number of variables as well as the influence of various combinations of variables, continued research will be required to distill out the key aspects of coping that ultimately can be used clinically as management tools for the chronic pain patient.

4.5 Chronic pain and stress, appraisal and coping strategies in a nutshell

From the review of literature, it can be seen that chronic pain is a complex disease process. The chronic pain experience is affected by stress, appraisal and coping. Stress can play a role in contributing towards the pain experience as well as being a consequence thereof, indicating that the relationship between pain and stress may be direct or indirect. Appraisal has been an important factor in predicting adjustment to chronic pain. Some beliefs have been shown to mediate the relationship between pain severity and adjustment, and have also been shown to influence whether adaptive or maladaptive coping strategies are utilised. Research has also provided evidence that coping strategies play an important role in adjustment to chronic pain. In general, maladaptive strategies have been shown to predict poorer adjustment and adaptive strategies have predicted better adjustment. Further research is required in the field of chronic pain and coping prior to definitive conclusions being made regarding the direct applicability of this information for the management of the chronic pain patient.

There appears to be the lack of an overall theoretical framework in which the relationship between chronic pain with stress, appraisal and coping has been conceptualised. The application of Lazarus and Folkman's theory (1984a) to the chronic pain experience may be useful in this regard, and will therefore be considered in the following chapter.

CHAPTER FIVE:

THE APPLICATION OF LAZARUS AND FOLKMAN'S THEORY OF STRESS,

APPRAISAL AND COPING TO CHRONIC PAIN

5.1 Introduction

As indicated by the above literature review, the concepts of stress, appraisal and coping have been substantially evaluated in chronic pain research. Various researchers have indicated a positive relationship between stress and pain intensity (Affleck et al., 1994; Fisher et al., 1996; Holmstrom et al., 1992; Jensen et al., 1994; Penzien et al., 1993). Pain patients have been shown to have negative beliefs regarding their pain experience (Geisser et al., 1994a; Gibson & Helme, 2000; Jensen & Karoly, 1992; Jensen et al., 1991; Jensen et al., 1994; Jensen et al., 1999; Toomey et al., 1991). In the literature of coping with chronic pain, active, adaptive strategies have generally predicted better adjustment while passive, maladaptive strategies have predicted poorer adjustment (Brown & Nicassio, 1987; Geisser et al., 1994a; Jensen et al., 1991; Lefebvre et al., 1995; Snow-Turek et al., 1996; Spinhoven & Linssen, 1991; Zautra et al., 1995).

To the author's knowledge, research reflects an absence of a theoretical framework in which to conceptualize the above-mentioned relationships between stress, appraisal and coping in the context of chronic pain. While Lazarus and Folkman's theory (1984a) has been applied to various disease entities, there appears to be a paucity of data on its direct application to pain intensity in chronic pain patients. It is thus the author's intention to apply Lazarus and Folkman's model to aspects of stress, appraisal and coping, as experienced by the chronic pain sufferer.

As indicated in Chapter Three, Lazarus and Folkman define stress as "... a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984a, p.19). Whether a particular person-environment relationship is considered to be stressful, is largely determined by cognitive appraisal (Lazarus & Folkman, 1984a). Through cognitive appraisal processes, the person evaluates the significance of what is happening for his or her well-being and whether he/she has adequate ability and resources to cope with the situation (Lazarus & Folkman, 1984a). Lazarus and Folkman (1984a) define coping as cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person. This concept of stress is process rather than trait orientated as it implies a dynamic and ongoing encounter that changes and unfolds over time.

The author finds the application of the Parallel Processing Model of pain to be beneficial in so far as it enhances one's understanding of the chronic pain experience, in the context of Lazarus and Folkman's theoretical framework. As indicated in the second chapter of this thesis, the Parallel Processing Model proposes the simultaneous encoding of both the sensory and affective components of the pain stimulus. The pain experience is evaluated according to a schema, which contains both the sensory as well as the emotions associated with this experience. The person's appraisal of the pain stimulus is in accordance with the schema, thereby biasing the perception of the noxious stimulus per se. A pain schema is likely to be associated with distress, in light of pain being an inherently unpleasant experience. If the affective component of the person's pain experience is associated with unpleasantness, the schema is likely to be associated with a level of distress, and the pain experience is thus likely to be perceived as stressful.

It is the researcher's intention to now provide a more detailed rationale as to how Lazarus and Folkman's theory of Stress, Appraisal and Coping (1984a) can provide a framework in which to conceptualize the chronic pain experience.

5.1.1 The Stress Process

The stress process is influenced by appraisal, coping and adjustment (Lazarus and Folkman, 1984a). The person perceives the chronic pain experience in accordance with a schema. If the person's schema is associated with the unpleasant nature of pain and therefore a level of distress, the pain experience will be assumed to adversely affect the relationship between the person and his/her environment, to exceed the person's resources and to threaten his/her wellbeing. The distress schema will elevate the person's stress level and in turn bias the noxious stimulus in an adverse way. This positive relationship between stress level and pain intensity is reflected in previous research (Affleck et al., 1994; Fisher et al., 1996; Holmstrom et al., 1992; Jensen et al., 1994; Klapow et al., 1995; Penzien et al., 1993).

5.1.2 The Appraisal Process

The first phase of this process is primary appraisal. In the person's first cognitive response to the chronic pain experience, he/she assesses whether there is potential harm to his/her physical wellbeing. The chronic-pain experience has strong motivational relevance, in so far as it has the potential to adversely affect the achievement of personal goals. An appraisal of harm/loss implies that damage has been done and an appraisal of threat implies future potential for harm/loss (Lazarus & Folkman, 1984a). It is suggested that chronic pain patients have a tendency towards a

primary appraisal of harm/loss and also possibly of threat, as this disease has the potential to adversely affect their quality of life and is treated within a predominantly palliative rather than curative context. Research findings confirm the negative attitudes that patients have attributed to their pain experience (Geisser et al, 1994a; Gibson & Helme, 2000; Jensen & Karoly, 1992; Jensen et al., 1991; Jensen et al., 1994; Jensen et al., 1999; Toomey et al., 1991).

During the secondary appraisal process, the person considers whether anything can be done to prevent harm. He/she will evaluate which coping-strategies can be employed as well as a potential outcome of the situation. The existing distress schema may negatively influence this evaluation process. The uncertainty associated with the chronic pain sufferer's future and the likelihood of this condition being lifelong may also adversely affect the person's method of coping as well as his/her perceived outcome of the situation.

5.1.3 The Coping Process

According to Lazarus and Folkman's theory, coping implies the application of purposeful cognitive and behavioural efforts to manage those internal and external demands of the chronic pain experience that are appraised as taxing or exceeding his/her resources. Problem-focused coping will predominate when the person believes that something can be done about his/her situation. Emotion focused coping will predominate when the person feels that the stressful situation must be endured. If the coping process is influenced by negative appraisal, it is likely that the person will approach the pain experience in a passive, emotion-focused manner. The review of literature confirms that many people who suffer from chronic pain will employ emotion-focused coping. The latter is likely to manifest in passive rather than active coping strategies.

5.1.4 The Adjustment Process

Lazarus and Folkman (1984a) view adjustment in terms of social functioning, morale and somatic health. A useful measure of somatic health in chronic pain sufferers is pain intensity. As a consequence of the distress-schema, the person's perception of the noxious stimulus will be adversely biased, manifesting in a positive relationship between the person's stress level and his/her pain intensity. Because this schema will impact the patient's appraisal and methods of coping, it is likely that there will be a positive relationship between negative appraisal and pain intensity, as well as between passive coping methods and pain intensity.

5.2 Conclusion

Lazarus and Folkman's theory provides a potentially useful framework in which to conceptualise stress, appraisal and coping in the context of chronic pain. The Parallel Processing Model of pain provides an explanation for the affective component of pain adversely affecting the way in which the person appraises the pain and subsequently copes with it. The dual processing of the sensory and affective components of the pain experience will bias the noxious stimulus, and the perception of pain will thus not be directly proportional to the sensory stimulus *per se*.

CHAPTER SIX: **METHODOLOGY**

6.1 Introduction

In this chapter, the researcher will first present the aims of the current study and the hypotheses, based on the review of literature. The sample selected for the study will then be introduced. The instrument that was used for the purpose of this research will be outlined, and the procedure for implementing the intended design will finally be presented.

6.2 Aims of the study

The aim of the study is to broadly investigate the application of aspects of Lazarus and Folkman's Theory of Stress, Appraisal and Coping, to the chronic pain experience. More specifically, the researcher will investigate the impact of stress, appraisal and coping on pain intensity in a chronic pain population.

To the researcher's knowledge, existing instruments in the above-mentioned areas have not been validated for the South African context. It was thus necessary to adapt well-known international instruments in order to make them suitable for the current study.

6.3 Hypotheses

The following hypotheses have been formulated in order to investigate the aims noted above:

Hypothesis 1: There will be a positive relationship between stress level in chronic pain patients and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity.

Hypothesis 2: (i) There will be a positive relationship between the intensity of negative attitudes towards the pain experience in chronic pain patients and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity.

(ii) There will be a negative relationship between the intensity of positive attitudes towards the pain experience in chronic pain patients and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity.

Hypothesis 3: (i) There will be a negative relationship between the frequency of employing active, problem-focused coping-strategies in the present chronic pain population and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity.

(ii) There will be a positive relationship between the frequency of employing passive, emotion-focused coping-strategies in the present chronic pain population and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity.

These three hypotheses will be conceptualised in the context of Lazarus and Folkman's theoretical framework.

6.4 Sample

The sample for this study comprised 105 chronic pain patients. A convenience sample was used, based on those pain clinics to which the researcher could obtain access. Thirty subjects attended the pain clinic at Groote Schuur Hospital and twenty received treatment from Tygerberg Hospital in the Cape Province. Of the remaining fifty-five patients, twenty attended the pain clinic at Hillbrow Hospital in Johannesburg, eighteen attended Grey's Hospital in Pietermaritzburg, and seventeen received treatment from the Pain Clinic at National Hospital in Bloemfontein.

Each subject was required to fulfil the criteria for a diagnosis of chronic pain. In this context, chronic pain is defined as pain which has persisted beyond the usual course of acute disease or expected time for an injury to heal, or pain that recurs at intervals for months or years (Bonica, 1990). The minimum duration of pain required for each subject to participate in this study was six months. The researcher verified the duration of pain with each patient to ensure that this requirement was met. The medical practitioner at the respective pain clinics confirmed each subject's diagnosis of chronic pain. Those patients who had attended psychotherapy during the past five years or had previously attended courses in pain management, coping-skills or life-skills, were excluded from this sample. The rationale for the latter patients being excluded from the study is that these factors may have impacted on the subjects' stress levels, coping methods or appraisal of pain. Each patient attending these clinics at the times that the researcher was present, was asked whether he/she would be prepared to participate in this study. The researcher received verbal consent from each subject prior to him/her participating in the study. The selection of

subjects with respect to age, sex, ethnic group, medical diagnosis and duration of pain, (providing the patient had experienced pain for longer than six months), was therefore chosen randomly.

6.5 Instrument

There is no available single instrument that measures pain intensity, stress, appraisal and coping in chronic pain patients. The researcher thus combined various validated assessment tools into a single questionnaire. The researcher and two independent evaluators assessed the appropriateness of the respective items of the original instruments, relative to the South African context. The responses from the researcher as well as the two evaluators were then compared. The instruments were then selectively adapted. In addition to these quantitative instruments, the researcher added a section on demographic details to the questionnaire. This South African Chronic Pain Questionnaire (SACPQ) is intended to assess selected aspects of chronic pain, stress, appraisal and coping in a chronic pain population.

The questionnaire is divided into the following sections:

- Part I: Demographic and personal details
- Part II: The Short Form of the McGill Pain Questionnaire (SF-MPQ)
- Part III: The Perceived Stress Questionnaire (PSQ)
- Part IV: The Stress Evaluation Inventory (SEI)
- Part V: The Survey of Pain Attitudes (SOPA)
- Part VI: The Coping Strategies Questionnaire (CSQ)

As noted, Parts III-VI of the questionnaire were adapted prior to the Pilot Study, in order to make them more appropriate for the current sample. A bilingual Medical Practitioner, who works in the field of pain, translated the questionnaire into Afrikaans. Equivalency of meaning was refined by cross translation of each item by a bilingual Honours Psychology Graduate. The English and Afrikaans versions of the SACPQ can be referred to in Appendix 1.

The researcher conducted the English and Afrikaans interviews. A Nursing Sister was employed to conduct interviews with those patients who were not able to understand either English or Afrikaans. The Nursing Sister was coached by the researcher regarding the method of questionnaire administration. The researcher was present at those interviews that were conducted by the Nursing Sister.

A Pilot Study was conducted on the first 50 chronic pain patients in order to assess the internal reliability of the adapted questionnaires to a South African chronic pain population. The subjects included in the Pilot Study attended the pain clinics at either Groote Schuur or Tygerberg Hospital in the Cape Province. The findings of the Pilot Study are indicated below.

Table 1: Cronbach Alpha Coefficients for Subsections of the SACPQ (N=50)

QUESTIONNAIRE	CRONBACH ALPHA COEFFICIENT
Short Form McGill Pain Questionnaire (SF-MPQ)	0.84
Perceived Stress Questionnaire (PSQ)	0.95
Stress Evaluation Inventory (SEI)	0.92
Survey of Pain Attitudes (SOPA)	0.78
Coping Strategies Questionnaire (CSQ)	0.78

As indicated in Table 1, the Cronbach Alpha Coefficients of the respective measures of the SACPQ reflect good internal reliability.

6.5.1 Part I: Demographic and personal details

Personal information obtained from the questionnaire includes the date of questionnaire administration, name, and contact details. The motivation for the latter questions was to ensure that the same subject was not interviewed more than once. Demographic details include language, sex, and date of birth. Additional details obtained include the location, duration, and the medical explanation for the pain.

Each subject was asked whether he/she was taking pain and/or psychiatric medication at the time of the interview. Whilst anti-depressants are frequently administered for the management of neuropathic pain, this does not exclude the possibility of the patient taking the medication for depression (Shipton, 1993). The reason for the prescription of psychiatric medication was thus asked of the subject. Each interviewee was then asked whether he/she has attended psychotherapy, pain management sessions, coping-skills or life-skills courses during the five years prior to questionnaire completion. The motivation for the latter questions was to exclude these subjects from the study, as the psychotherapy or attendance to such courses, may have impacted on the subjects' stress levels, appraisal or coping methods of pain.

6.5.2 Part II: Short-Form McGill Pain Questionnaire

The McGill Pain Questionnaire (MPQ) has been used in clinical practice and research settings since its initial publication in 1975 (Melzack, 1975). The MPQ has subsequently been shown to be one of the most widely used tests for diagnosis and research regarding the measurement of pain (Grushka & Sessle, 1984; Holroyd, Holm, Keefe, Turner, Bradley, Murphy, Johnson & Anderson, 1992; Melzack, Katz & Jeans, 1985; Melzack, Terrence, Fromm & Amsel, 1986). The MPQ provides relevant information regarding the sensory, affective and evaluative components of the pain experience. It is also able to discriminate amongst various pain conditions (Melzack et al., 1985). The MPQ has proven to be too time-consuming for various studies (Melzack, 1987).

Melzack published the Short form of the McGill Pain Questionnaire in 1987. The SF-MPQ is desirable for those types of research that require more rapid acquisition of data than the MPQ. The SF-MPQ takes approximately two to five minutes to administer (Melzack, 1987). The words have been found to be simple and understandable by all subjects, and the questionnaire is also capable of discriminating between different pain syndromes (Melzack, 1987).

The SF-MPQ provides information on the sensory and affective dimensions of the subject's pain experience (Melzack, 1987). The main component of the SF-MPQ consists of fifteen descriptors. The first eleven represent the sensory dimension of the pain experience and the next four represent the affective dimension (Melzack, 1987). The subject rates each descriptor on an intensity scale, where 'zero' represents 'none', 'one' represents 'mild', 'two' represents 'moderate' and 'three' represents 'severe'. The sensory and affective scores are summed in order to give a total score (Melzack, 1987). The sensory and affective scores are also examined independently of the total score.

The SF-MPQ includes a Present Pain Intensity (PPI) Index, as well as a visual analogue scale. These two measures provide indices of overall pain intensity (Melzack, 1987). The PPI measures pain at the time of the interview (Melzack, 1987). The visual analogue scale has been adapted to form a numerical rating scale, whereby 'zero' represents 'no pain' and 'six' represents the 'worst possible pain' experienced during the week prior to the interview. This numerical rating scale is consistent with others in the SACPQ, making comparisons across the questionnaire possible.

In the Results section of this study, all descriptive statistics calculated for the SF-MPQ have been converted to percentages of the maximum possible score for each scale or subscale, respectively. This enabled the data to be presented in a more meaningful way.

The MPQ has been found to have very strong test-retest reliability coefficients (Love, Loeboeuf & Crisp, 1989). The validity of the distinction between the Sensory and the affective dimensions is very high, according to a review of the literature by Reading (1984). Correlation coefficients between pain rating scales have been obtained with the MPQ and the SF-MPQ, across various types of pain conditions (Melzack, 1987). For the sensory dimension, r-values have varied between 0.65 and 0.88. For the affective dimension, r-values have varied between 0.69 and 0.94 (Melzack, 1987). For the Total Score, r-values have varied between 0.70 and 0.93. These correlations are all consistently high and significant (Melzack, 1987).

When testing the hypotheses, Sensory pain intensity was assessed by the sensory component of the SF-MPQ. Affective pain intensity was assessed by the affective component of the SF-MPQ. The Total score for the SF-MPQ, the PPI and the numerical rating scale were used to assess the overall pain intensity.

6.5.3 Part III: Perceived Stress Questionnaire

The Perceived Stress Questionnaire (PSQ) was designed as a measure of stress, intended specifically for clinical psychosomatic research (Levenstein, Prantera, Varvo, Scribano, Berto, Luzzi, & Andreoli, 1993). The PSQ considers perceived psychosocial factors that may trigger symptoms of the person's disease (Levenstein et al., 1993). Cognitive aspects of the stress experience are thus measured (Levenstein et al., 1993). The PSQ measures one's level of perceived stress during the previous month (Recent PSQ) alternatively during the past one or two years (General PSQ) (Levenstein et al., 1993). In the present study, the measure was taken over the past month.

The test-retest reliability was found to be 0.82 for the General PSQ. The Recent PSQs test-retest reliability varies by a mean factor of 1.9 over six months, with an alpha coefficient >0.9 (Levenstein et al., 1993). The PSQ has also been found to have high internal consistency and construct validity (Levenstein et al., 1993). All interfactor correlations were shown to have $r < 0.4$ (Levenstein et al., 1993).

This questionnaire contains 30 items. The original scale had scoring from 'one' to 'four', (1 = almost never, 2 = sometimes, 3 = often and 4 = usually). The scale was adapted to a numerical rating scale, whereby 'zero' represents 'never applies to me', and 'six' represents 'always applies to me', in order to provide consistency in measurement across the SACPQ. Various items in the original PSQ are reversed in order to avoid acquiescence. All of the scores for the respective items are summed in order to give a total score, reflecting the respondents perceived level of stress.

Principal component analysis of 230 completed PSQ's yielded seven factors with eigen-values greater than one (Levenstein et al., 1993). The seven factors comprising the PSQ are listed below, and an example of a question from each factor has been provided:

- (i) Harassment: e.g. "You are under pressure from other people"
- (ii) Overload: e.g. "You have too many things to do"
- (iii) Irritability: e.g. "You feel calm"
- (iv) Lack of joy: e.g. "You are light hearted"
- (v) Fatigue: e.g. "You feel tired"
- (vi) Worries: e.g. "You have many worries"
- (vii) Tension: e.g. "You feel tense"

In the Results section of this study, all descriptive statistics calculated for the PSQ have been converted to percentages of the maximum possible score for the scale and for each subscale, respectively. This enabled the data to be presented in a more meaningful way.

6.5.4 Part IV: Stress Evaluation Inventory

The Stress Evaluation Inventory (SEI) is a 30 item questionnaire (Madsen, 1983). This measurement tool assesses how frequently potentially stressful events occur in the occupational, family and personal spheres of the person's life.

This questionnaire comprises the following three subscales:

- (i) Career
- (ii) Family
- (iii) Personal

In light of a substantial proportion of the chronic pain population in the current study being potentially unemployed, the 'Career' subscale was excluded from the SACPQ. Certain of the items from the remaining subscales were omitted based on their being potentially inappropriate in either vocabulary level or context, for the current population. The adapted scale thus consists of seven statements within the 'Family' subscale and eight statements in the 'Personal' subscale. The scores of the respective items are added together in order to calculate the scores from the two subscales. The total score is calculated by summing the two subscale scores.

The items on the original SEI were rated on a scale from 'zero' to 'two', (0 = does not apply to me, 1 = sometimes applies to me and 2 = frequently applies to me). This scale was adapted to a numerical rating scale from 'zero' to 'six', (where 'zero' represents 'does not apply to me' and 'six' represents 'always applies to me'), in order to retain continuity in measurement across the questionnaire. A score of 'zero' represents 'no stress', a score of 'three' represents 'a moderately stressful response' and a score of 'six' represents 'an extremely stressful response'. The reliability of the original 'Family' subscale is 0.89 and that of the 'Personal' subscale is 0.75 (Madsen, 1983).

In the Results section of this study, all descriptive statistics calculated for the SEI have been converted to percentages of the maximum possible score for the scale. This enabled the data to be presented in a more meaningful way.

When testing the first hypothesis, the subscale and total scores from the SEI, as well as the total score from the PSQ, were used to measure the level of stress.

6.5.5 Part V: Survey of Pain Attitudes

The Survey of Pain Attitudes (SOPA) is a 57 item self-report scale that assesses the intensity of pain-related beliefs in chronic pain patients (Jensen, Karoly & Huger, 1987). The SOPA comprises the following seven subscales:

- (i) **Control:** the belief in one's personal control over one's pain.
- (ii) **Disability:** the belief in oneself as being unable to function because of one's pain.
- (iii) **Harm:** the belief that one's pain signifies damage and that exercise and activities should thus be restricted.
- (iv) **Emotion:** the belief in a relationship between one's emotion and one's pain.

- (v) **Medication:** the belief that medications, in general, are appropriate for the treatment of chronic pain.
- (vi) **Solicitude:** the belief in the appropriateness of solicitous responses from one's family when one is in pain.
- (vii) **Medical cure:** the belief that a medical cure exists for one's pain problem.

In the SOPA, each statement is rated on a numerical rating scale of 'zero' to 'four', where 'zero' represents 'this is very untrue for me', and 'four' represents 'this is very true for me'. In the current study, the scale has been adapted to a numerical rating scale ranging from zero (this is very untrue for me) to six (this is very true for me). The purpose of adapting the scale was to keep a consistent numerical rating scale measurement across the questionnaire. This would allow for continuity in measurement across the questionnaire and would contribute towards simplicity in questionnaire completion. When scoring the SOPA, certain items are reverse scored, prior to all the items within each respective subscale being summed together to give seven pain attitude scores.

In the Results section of this study, all descriptive statistics calculated for the SOPA, have been converted to percentages of the maximum possible score for each subscale. This enabled the data to be presented in a more meaningful way.

The SOPA was reduced to 35 items for the present study as the vocabulary used in certain items might have posed difficulties for the present sample. Also, as the SOPA is a seven-component questionnaire, it was necessary to limit the number of items in the respective scales, in order to limit the time spent on completing the interview. Five items were retained from each of the seven subscales, with 17 reversed-order items being included in order to avoid acquiescence. The selected items were not altered.

On the original SOPA, the internal consistency of the subscales ranges from 0.71 to 0.81, and test-retest reliability coefficients range from 0.63 to 0.68 (Jensen et al., 1994). The absolute values of the correlation coefficients between the scales range from 0.03 to 0.41, with a median of 0.13, indicating that each scale accounted for a maximum of 17% of the variance in any other scale.

When testing the second hypothesis, the subscale scores from the SOPA were used to measure the intensity of negative and positive attitudes towards the pain experience.

6.5.6 Part VI: Coping Strategies Questionnaire

The Coping Strategies Questionnaire (CSQ), as compiled by Rosenstiel and Keefe (1983), is the most widely used measurement of pain coping strategies (Swartzman et al., 1994). The CSQ is comprised of 48 items. The patient is asked to indicate the extent to which he/she uses the respective strategies on a scale of 'one' to 'six', where 'one' represents 'not at all' and 'six' represents 'always'.

The CSQ comprises the following eight subscales:

Cognitive Coping Strategies:

- (i) *Diverting attention:* thinking of things that serve to distract one away from the pain
- (ii) *Reinterpreting pain sensations:* imagining something, which if real, would be inconsistent with the experience of pain
- (iii) *Coping self-statements:* telling oneself that one can cope with the pain, no matter how bad it gets
- (iv) *Ignoring pain sensations:* denying that the pain hurts or affects one in any way
- (v) *Praying or hoping:* telling oneself to pray and hope that the pain will get better someday
- (vi) *Catastrophising:* negative self-statements, catastrophising thoughts and ideation

Behavioural Coping Strategies:

- (vii) *Increasing activity level:* engaging in active behaviours which direct one's attention away from the pain
- (viii) *Increasing pain behaviour.* overt pain behaviours that reduce pain sensations

The CSQ was adapted in order to make it more applicable for the present study. Only 24 of the 48 items were included. Three items were retained out of the six from each subscale. Various items were eliminated based on their potential lack of applicability to the subjects in the sample, e.g. 'I use a heating pad'. Adapting the questionnaire also reduced the time required to complete the interview. The scale was adapted to range from 'zero' (never do that) to 'six' (always do that), such that consistency in measurement across the questionnaire was maintained.

In order to determine the reliability of each of the eight subscales in the CSQ, alpha coefficients were computed using all six items in each subscale (Rosenstiel & Keefe, 1983). Internal reliability ranged from 0.71 to 0.85, with the exception of Increasing Pain Behaviour, which yielded an alpha coefficient of only 0.28 (Rosenstiel & Keefe, 1983). The researcher chose to include the latter subscale despite its reasonably low reliability. While chronic low back pain patients reported using some coping strategies more frequently than others, the overall effectiveness of coping strategies employed was rated to be low (Rosenstiel & Keefe, 1983). High face and construct validity has been found for the Catastrophising, Reinterpreting Pain Sensations, Praying and Hoping, and Ignoring Pain Sensations subscales (Swartzman et al., 1994). DeGood and Shutty (1992) described the clinical utility of the CSQ as being well established.

The CSQ also comprises two effectiveness rating scales, measuring the subjects' perceived level of control over their pain and their perceived ability to decrease the pain. The concept of control has been assessed by the SOPA, as a belief in one's ability to exert a level of personal control over the pain experience. The focus of coping in the current research is on strategies, per se. In light of these concepts being beyond the direct focus of the current thesis, these questions were omitted from the SACPQ.

For the purpose of testing the third hypothesis in this study, the coping strategies from the CSQ have been classified as either active or passive. The CSQ does not categorise coping strategies in this manner. The factor analysis classification from the VPMI (Brown & Nicassio, 1987) has thus been employed in this regard. Brown and Nicassio (1987) define active coping as one playing an active role in order to manage the pain, whereas passive coping is viewed as not playing an active role in this process. Diverting Attention, Ignoring Sensations and Increased Activity Level are classified as active strategies according to the VPMI (Brown & Nicassio, 1987). Praying/Hoping, Catastrophising and Increased Pain Behaviours are classified as passive strategies (Brown and Nicassio, 1987). Brown and Nicassio (1987) suggest that active coping strategies are adaptive, whereas passive coping strategies are maladaptive (Brown & Nicassio, 1987). Factor analysis on the VPMI could not definitively classify Reinterpreting Pain Sensations and Coping Self-Statements as being either active or passive.

Lazarus and Folkman (1984a) conceptualise coping as cognitive and behavioural efforts to manage internal and external demands. Problem-focused coping predominates when the person

believes that something can be done about his/her situation, while emotion-focused coping predominates when the person feels that the stressful situation must be endured (Lazarus & Folkman, 1984a). These definitions can be used to further explain Brown and Nicassio's (1987) concept of active and passive coping-strategies. Diverting attention and increasing one's behaviour requires effort, and these strategies can thus be conceptualised as active, problem focused coping strategies. In this context, it is assumed that the person consciously applies effort in order to ignore the pain sensation, implying that Ignoring Sensation would be considered an active, problem-focused strategy. The author suggests that Reinterpreting Pain Sensations is also an active, problem-focused strategy, since the person is required to exert a level of effort in order to change his/her pain experience.

For the purpose of this research, the author proposes Coping Self-Statements to be an active, problem-focused coping strategy. While no definitive conclusions can be drawn from the VPMI regarding Coping self-Statements, the factor loading revealed a stronger association with active rather than passive coping (Brown & Nicassio, 1987). Also, Coping Self-Statements have predicted greater perceptions of control over pain, even after controlling for pain severity and education in a chronic pain population (Haythornwaite et al., 1998). Hill (1993) found positive Coping Self-Statements to be associated with lower levels of pain severity and less psychological distress. Although research indicates that the evidence for the usefulness of coping self-statements is equivocal, where differences do exist, they are more likely to be adaptive rather than maladaptive (Boothby et al., 1999; Haythornwaite et al., 1998; Hill, 1993).

In summary, for the purpose of this research, Diverting Attention, Reinterpreting Sensations, Coping Self-Statements, Ignoring Sensations and Increased Activity Level are considered to be active, problem-focused strategies. Praying/Hoping, Catastrophising and Increased Pain Behaviours are classified as passive strategies.

In the Results section of this study, all descriptive statistics calculated for the CSQ, have been converted to percentages of the maximum possible score for each subscale. This enabled the data to be presented in a more meaningful way.

When testing the third hypothesis, the subscale scores from the CSQ were used to measure the frequency of active, problem-focused coping-strategies employed by the present chronic pain

population. The subscale scores from the CSQ were also used to measure the frequency of passive, emotion-focused coping-strategies employed by the subjects in the current sample.

6.6 Design

A multivariate correlational design was employed, wherein the relationship between stress, appraisal and coping was investigated with respect to pain intensity in a chronic pain population.

6.7 Statistical procedures

In the pilot study, Cronbach Alpha Coefficients were calculated in order to establish the internal reliability of the adapted questionnaires. In the main study, strength of association was measured using Spearman Rank Correlations, with a cut off that is ≥ 0.7 , as an indication of a strong correlation. Data were analysed using SAS statistical software Version 6 (SAS Institute, USA).

6.8 Procedure

The researcher attended the Pain Clinics at various hospitals during the specified times that the clinics were being run. During these specified times, each patient, who fulfilled the inclusion criteria for the study, was asked for his/her verbal consent to participate in the study. The researcher then explained what participation in the study would entail. This included an explanation regarding the requirement to respond to the various questions according to a numerical rating scale. Each subject was required to complete the SACPQ, assessing aspects of pain, stress, appraisal and coping. The questionnaire was administered in the form of an interview. Each interview lasted between 50 and 60 minutes.

CHAPTER SEVEN:

RESULTS

7.1 Introduction

The author will first present demographic information. Descriptive statistics of the respective components of the questionnaire will then be presented. All descriptive statistics have been converted to percentages of the maximum score, as this enables data to be presented in a more meaningful way. The scales yield values within a limited range. The relationship between these numbers becomes more meaningful if expressed as a percentage on a scale ranging from zero to 100 percent. In the final component of the result section, Spearman Rank Correlation Coefficients are presented in order to test each proposed hypothesis.

7.2 Basic demographic information

Part 1 of the Questionnaire: Demographic Details

Table 1a: Demographic data of the sample (N=105), expressed as percentages.

	Subcategory	Percentages
Sex	Male	48.57%
	Female	51.43%
Ethnicity	White	39.05%
	Coloured	31.43%
	Black	16.19%
	Indian	13.33%
Language	English	42.86%
	Afrikaans	42.86%
	African language	14.28%

From the above data, it can be seen that there is an approximately equal male to female ratio in the sample. The majority of the sample comprises White and Coloured subjects (39.05% and 31.43% respectively). 16.19% of the subjects are Black, with the remaining 13.33% being Indian. The primary language of 14.28% of the sample is an African one, namely Zulu, Xhosa, Tswana or Sotho. The remainder of the sample has an equal ratio of either English or Afrikaans as their primary language.

Table 1b: Descriptive statistics of those subjects taking pain medication and those receiving psychiatric treatment. The data are expressed as percentages for the total sample (N=105).

	Subcategory	Percentage
Pain Medication	Yes	93.33%
	No	6.67%
Psychiatric Medication	Yes	8.57%
	No	91.43%

From the above table, it can be seen that the majority of the subjects (93.3%) take pain medication. 8.57% of the subjects are in receipt of psychiatric treatment. The majority of the latter subsample was taking anti-depressant medication for neuropathic pain and/or for depression.

Table 1c: Descriptive statistics of the age of the respondents (years) and the duration of their reported pain (months). Data are indicated for the total sample (N=105).

	Mean	SD	Median	Range
Age (Years)	48.78	13.64	48.00	21-82
Duration (Months)	106.88	138.04	60.00	6-672

SD represents Standard Deviation.

The mean age of the respondents is 48.78 years. The mean duration of pain for the subjects within this chronic pain population is 106.88 months (8.91 years), and has a substantial range, from six months to 56 years (672 months).

7.3 Descriptive statistics

PAIN

Part II of the questionnaire: The Short-Form McGill Pain Questionnaire

Table 2a: *Descriptive statistics of the Sensory, Affective and Total Pain scores indicated by the Short-Form McGill Pain Questionnaire are indicated in the table below. Data of the Present Pain Intensity (pain intensity experienced at the time of the interview), as well as data of the average pain intensity experienced during the week prior to questionnaire completion, as indicated by the Numerical Rating Scale, are also reflected. Values are expressed as percentages of the maximum possible score for each scale or subscale, for the total sample (N=105).*

	Mean	SD	Median	Range
Sensory (A)	49.41	22.83	51.52	6.06-100
Affective (B)	56.19	28.33	58.33	0-100
Total (A+B)	51.22	22.45	53.33	4.44-100
PPI	68.57	22.85	80.00	20.00-100
NRS	81.75	17.83	83.33	16.67-100

SD represents standard deviation. PPI represents Present Pain Intensity. NRS represents numerical rating scale.

The subjects ranked each descriptor on the SF-MPQ on an intensity scale, where 'zero' represents 'none', 'one' represents 'mild', 'two' represents 'moderate' and 'three' represents 'severe'. When analysing the data for the total sample, it can be deduced that the respondents' sensory experience of their pain bordered on moderate intensity at the time of their interviews. The mean percentage of the affective component of the subjects' pain experience was calculated to be 56.19% of the maximum possible intensity. These data reflect a moderately intense affective dimension of the subject's pain experience. The subjects' total scores yielded from the Short-Form McGill Pain Questionnaire lie in the range of moderate pain. The average PPI score that is indicated for the total sample is 68, 57%, lying in the middle of the 'moderate' pain category. On a numerical rating scale, where zero represents no pain, and six represents the worst pain imaginable to that individual, the mean percentage of pain experienced by the total sample during the week prior to questionnaire completion, was 81.75%.

STRESS

Part III of the questionnaire: Perceived Stress Questionnaire

Table 2b: Descriptive statistics of subscales from the Perceived Stress Questionnaire. Data are expressed as percentages of the maximum possible score for each subscale as well as for the total scale (N=105).

	Mean	SD	Median	Range
Harassment	49.17	28.77	54.17	0-100
Overload	46.51	28.67	50.00	0-100
Irritability	58.73	28.48	66.67	0-100
Lack of joy	50.88	23.18	52.38	0-100
Fatigue	64.72	21.34	62.50	12.5-100
Worries	54.73	26.49	60.00	0-100
Tension	66.67	26.45	70.83	0-100
Total Score	54.47	21.25	58.33	5-97.22

SD represents standard deviation.

When analysing data from the seven subscales, respondents yielded the highest mean scores for the 'Tension' (66.67%) and 'Fatigue' (64.72%) subscales. The lowest area of perceived stress found by the respondents was 'Overload' (46.51%). The total mean perceived stress score was calculated to be 54.47%.

Part IV of the questionnaire: Stress Evaluation Inventory

Table 2c: Descriptive statistics of the Family and Personal subscales, as well as the total score yielded from the Stress Evaluation Inventory. Scores are expressed as percentages of the maximum possible score for each subscale as well as for the total scale (N=105).

	Mean	SD	Median	Range
Family	44.17	29.65	40.48	0-100
Personal	41.71	25.28	39.58	0-100
Total	42.86	24.74	42.22	0-97.78

SD represents standard deviation.

Data reflects a slightly higher contribution of familial (44.17%) factors than personal factors (41.71%) to the subject's total experience of stress.

APPRAISAL

Part VI of the questionnaire: Survey of Pain Attitudes

Table 2d: Descriptive statistics for the subscales of the Survey of Pain Attitudes. Data are expressed as percentages of the maximum possible score for each subscale, for the total sample (N=105).

	Mean	SD	Median	Range
Control	45.40	24.42	46.67	0-93.33
Disability	56.48	24.45	60.00	0-100
Harm	62.79	21.65	63.33	13.33-100
Emotion	57.87	22.26	60.00	0-100
Medication	83.78	18.99	90.00	20-100
Solicitude	56.35	26.93	60.00	0-100
Medical Cure	61.24	21.34	63.33	10-100

SD represents Standard Deviation

The mean score indicated for subjects' perceiving themselves to have control over their pain is only 45.40%. On the Disability and Harm subscales, the data revealed a mean score of 56.48% and 62.79%, respectively. These results are indicative of the subjects' perception of their inability to function effectively as a consequence of their pain, and their misperception that their pain implies physical damage being done to their bodies. Analysis of the Emotion subscale indicates that the subjects perceive emotion to have an impact on their pain experience (57.87%). The scores yielded for the Solicitude subscale indicate that the subjects' generally required a solicitous response from their family members with respect to their pain experience. The mean values obtained by the sample indicate a substantial belief that medication is appropriate for the treatment of their pain (83.78%), and that a medical cure exists for their pain problem (61.24%).

COPING

Part VIII of the questionnaire: Coping Strategies Questionnaire

Table 2e: Descriptive statistics for the respective subscales as well as the Total Score for the Coping Strategies Questionnaire. Data are expressed as percentages of the maximum possible score for each subscale as well as for the total scale (N=105).

	Mean	SD	Median	Range
(A) Diverting Attention	51.43	29.31	50.00	0-100
(A) Reinterpreting Sensations	20.95	26.51	11.11	0-100
(A) Coping Self-Statements	63.60	24.53	66.67	0-100
(A) Ignoring Pain Sensations	41.64	27.66	33.33	0-100
(P) Praying or Hoping	70.79	25.13	77.78	0-100
(P) Catastrophising	46.88	27.94	50.00	0-100
(A) Increased Activity Level	53.39	26.18	50.00	0-100
(P) Increased Pain Behaviours	66.14	16.37	66.67	16.67-100
Total Score	51.85	13.94	50.00	24.31-90.97

SD represents standard deviation. (A) represents active, problem-focused coping strategies and (B) represents passive, emotion-focused coping strategies.

The two most common coping strategies reflected by the data are Praying/Hoping and Increased Pain Behaviours. These coping strategies are both classified as passive. Coping Self-Statements is the active strategy that is most frequently employed by the current sample. Subjects divert their attention and increase their behavioural activities to a lesser extent. The mean percentages of 46.88% and 41.64% were yielded for subjects either Catastrophising or Ignoring Pain Sensations, as methods of coping with their pain. Relatively few subjects were shown to reinterpret the sensation of their pain.

7.4 Testing of hypotheses

THE RELATIONSHIP BETWEEN PAIN AND STRESS

Hypothesis 1: There will be a positive relationship between stress level in chronic pain patients and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity.

Table 3a: Spearman Rank Correlation Coefficient (*r*) and Probability (*p*) values for the respective measures of pain on the Short Form McGill Pain Questionnaire and the variables from the Stress Evaluation Inventory (SEI) as well as from the Perceived Stress Questionnaire (PSQ). (N=105).

	Total Score (SEI)	Family (SEI)	Personal (SEI)	Total Score (PSQ)
Sensory (SF-MPQ)	0.439 (0.0001)	0.405 (0.0001)	0.394 (0.0001)	0.344 (0.0003)
Affect (SF-MPQ)	0.507 (0.0001)	0.442 (0.0001)	0.480 (0.0001)	0.532 (0.0001)
Total (SF-MPQ)	0.505 (0.0001)	0.459 (0.0001)	0.459 (0.0001)	0.443 (0.0001)
PPI (SF-MPQ)	0.352 (0.0002)	0.335 (0.0005)	0.299 (0.0019)	0.254 (0.0090)
NRS (SF-MPQ)	0.261 (0.0071)	0.235 (0.0158)	0.265 (0.0062)	0.215 (0.0273)

PPI represents Present Pain Intensity and NRS represents Numerical Rating Scale.

A significant positive relationship between pain and stress is indicated by all the Spearman Rank Correlation Coefficients indicated in the table above. All of these correlations are of moderate strength, with the strongest relationships generally being indicated between the affect component of the SF-MPQ and the various measures of stress. The weakest correlations are indicated between the pain NRS of the SF-MPQ and the various measures of stress.

THE RELATIONSHIP BETWEEN PAIN AND APPRAISAL

Hypothesis 2: (i) There will be a positive relationship between the intensity of negative attitudes towards the pain experience in chronic pain patients and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity. (ii) There will be a negative relationship between the intensity of positive attitudes towards the pain experience in chronic pain patients and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity.

Table 3b: Spearman Rank Correlation Coefficient (r) and Probability (p) values for the respective measures of pain on the Short Form McGill Pain Questionnaire (SF-MPQ) and the variables from the Survey of Pain Attitudes (SOPA). ($N=105$).

	Sensory (SF-MPQ)	Affect (SF-MPQ)	Total (SF-MPQ)	PPI (SF-MPQ)	NRS (SF-MPQ)
Control (SOPA)	-0.139 (0.1570)	-0.201 (0.0399)	-0.178 (0.0696)	-0.212 (0.0299)	-0.239 (0.0140)
Disability (SOPA)	0.306 (0.0015)	0.331 (0.0006)	0.342 (0.0004)	0.422 (0.0001)	0.254 (0.0090)
Harm (SOPA)	0.220 (0.0242)	0.213 (0.0292)	0.236 (0.0153)	0.172 (0.0797)	0.152 (0.1216)
Emotion (SOPA)	0.327 (0.0007)	0.457 (0.0001)	0.405 (0.0001)	0.362 (0.0001)	0.133 (0.1767)
Medication (SOPA)	0.450 (0.0001)	0.408 (0.0001)	0.482 (0.0001)	0.271 (0.0039)	0.276 (0.0044)
Solicitude (SOPA)	0.353 (0.0002)	0.362 (0.0002)	0.406 (0.0001)	0.337 (0.0004)	0.211 (0.0310)
Medical-Cure (SOPA)	0.228 (0.0211)	0.086 (0.3845)	0.052 (0.5967)	0.094 (0.3377)	0.074 (0.4522)

PPI represents Present Pain Intensity and NRS represents Numerical Rating Scale.

A very weak negative relationship is indicated between the respective pain variables and the Control subscale score on the SOPA. The Affect score from the SF-MPQ has a stronger correlation with the Control subscale score than the Sensory score. Disability has a moderate positive relationship with the majority of the pain variables. Harm reflects a weak positive relationship with the pain variables. Emotion, Medication and Solitude indicate moderate positive correlations with all the pain variables other than the numerical rating scale, which reflects weak positive relationships. The other exception is when Medication is correlated with PPI, as this also reflects a weak positive relationship. Extremely weak correlations are indicated between medical cure and all the pain variables.

Hypothesis 3: (i) There will be a negative relationship between the frequency of employing active, problem-focused coping-strategies in the present chronic pain population and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity. (ii) There will be a positive relationship between the frequency of employing passive, emotion-focused coping-strategies in the present chronic pain population and the following: sensory pain intensity; the affective component of pain intensity and overall pain intensity.

Table 3c: Spearman Rank Correlation Coefficient (*r*) and Probability (*p*) values for the respective measures of pain on the Short Form McGill Pain Questionnaire (SF-MPQ) and the variables form the Coping Strategies Questionnaire (CSQ). (*N*=105).

	Sensory (SF-MPQ)	Affect (SF-MPQ)	Total (SF-MPQ)	PPI (SF-MPQ)	NRS (SF-MPQ)
(A) Diverting Attention (CSQ)	-0.033 (0.7347)	-0.203 (0.0374)	-0.098 (0.31851)	-0.251 (0.0098)	-0.057 (0.5642)
(A) Reinterpreting Sensations (CSQ)	-0.064 (0.5163)	-0.120 (0.2219)	-0.076 (0.4399)	-0.264 (0.0065)	-0.064 (0.5189)
(A) Coping Self- Statements (CSQ)	-0.253 (0.0093)	-0.373 (0.0001)	-0.320 (0.0009)	-0.336 (0.0005)	-0.146 (0.1384)
(A) Ignoring Pain Sensations (CSQ)	-0.183 (0.0621)	-0.289 (0.0027)	-0.233 (0.0167)	-0.216 (0.0268)	-0.051 (0.6037)
(P) Praying or Hoping (CSQ)	0.056 (0.5717)	0.133 (0.1756)	0.004 (0.9659)	0.019 (0.8507)	0.200 (0.0406)
(P) Catastrophising (CSQ)	0.272 (0.0049)	0.374 (0.0001)	0.345 (0.0003)	0.249 (0.0103)	0.254 (0.0089)
(A) Increasing activity level (CSQ)	-0.218 (0.0253)	-0.294 (0.0023)	-0.259 (0.0076)	-0.211 (0.0306)	-0.127 (0.1964)
(P) Increasing Pain Behaviour (CSQ)	0.003 (0.97581)	0.026 (0.7912)	0.015 (0.8820)	0.124 (0.2092)	0.172 (0.0801)

PPI represents Present Pain Intensity and NRS represents Numerical Rating Scale. (A) represents active, coping strategies and (B) represents passive coping strategies.

The affective component of the pain experience has a significant weak to moderate correlation with the majority of the CSQ subscale scores. This relationship is negative for the five active coping strategies, and is positive for the three passive coping strategies. Catastrophising reflects a moderately positive relationship when correlated with the Affective component of the SF-MPQ. Coping Self-Statements has a weak to moderate, negative relationship for all the pain variables, other than the numerical rating scale, which reflects an extremely weak negative relationship. The Ignoring Pain Sensations subscale yields a weak but significant negative relationship when correlated with the Affective subscale of the SF-MPQ, the Total Score of the SF-MPQ as well as with the PPI score. While the relationship between the Ignoring Pain Sensations subscale and both the Numerical Rating Scale as well as the Sensory score is negative, this relationship is not significant. The Praying/Hoping subscale shows a weak positive correlation with NRS. All other pain variables do not yield significant relationships when correlated with the Praying/Hoping subscale. Catastrophising reflects a weak to moderate positive relationship when correlated with all of the pain variables. Increasing Activity Level is shown to have a weak negative correlation with all of the pain variables. The relationship between Increased Pain Behaviour and all of the pain variables is very weak. When PPI is correlated with all the subscales of the CSQ, moderate relationships are yielded for the majority of the subscales. All of these significant relationships are negative, other than that for Catastrophising, which is positive. The Praying/Hoping and Increasing Pain Behaviour subscales yielded very weak positive relationships with the PPI score. The latter correlations are not significant.

CHAPTER EIGHT: **DISCUSSION**

8.1 Introduction

The aim of the study is to broadly investigate the application of aspects of Lazarus and Folkman's Theory of Stress, Appraisal and Coping, to the chronic pain experience. More specifically, the researcher will investigate the impact of stress, appraisal and coping on pain intensity in a chronic pain population. The researcher will first discuss the descriptive data of pain, stress, appraisal and coping. The respective hypotheses will be explored in the context of Lazarus and Folkman's theory of Stress, Appraisal and Coping (Lazarus & Folkman, 1984a). Limitations of this study will be acknowledged and future areas of research will be suggested.

8.2 Descriptive data

8.2.1 Pain

The average pain intensity perceived to be experienced by subjects at the time of the interview (as reflected by the Present Pain Intensity) was found to be 68.57% of the maximum pain that these people could conceptualise. If one considers the Parallel-Processing Model, both the sensory as well as the affective component of the subjects' experiences are reflected in the perceived pain intensity (Dar & Leventhal, 1993). The subjects' affective experience of their pain was found to have a higher level of perceived intensity than their sensory experience, at the time of their interview. This finding reflects the substantial contribution and impact of emotion on the subjects' overall pain experience.

The average pain intensity perceived by subjects during the week prior to the interview (as reflected by the numerical rating scale) was found to be 81.75% of the maximum pain that these people could conceptualise. The latter intensity is higher than that reported at the time of the interview. This response might be understood in terms of the overall pain experience being prominent in the subjects' lives, biasing their perceived pain intensity across a period of time. This finding may also be indicative of subjects' providing different responses, depending on whether they are given a list of descriptive words from which to choose (as with the PPI), as compared to being given a numerical rating scale. Further research is required in order to compare the consistency of findings across different methods of pain assessment.

8.2.2 Stress

The Perceived Stress Questionnaire (PSQ)

The PSQ assesses various aspects of the stress experience in the subject's life, not just that pertaining to the pain experience, per se. It is likely that numerous factors have contributed towards the subject's level of stress, and the direct influence of pain is thus not reflected separately in these results. It is also worth noting that the causal factor of the stress is not measured by the PSQ.

A relevant finding from the PSQ is that respondents reported their stress to be predominantly related to fatigue and tension. Subjects also reported experiencing a substantial amount of irritability and worry. The factors of the PSQ relate largely to affective aspects of the subjects' experience. According to Lazarus and Folkman's theory (1984a), appraisal and affect contribute towards the manifestation of stress. These results may thus reflect, to some extent, the integral nature of emotion to the pain experience, as indicated by the affective dimension of the SF-MPQ.

If one considers the significant proportion of chronic pain patients who experience symptoms of depression, it is interesting to note that the 'lack of joy' factor was calculated to have the lowest mean score as compared to the other subscales (Fishbain et al., 1997; Gallagher & Verma, 1999). It is possible that these subjects do not perceive low mood as being a significant contributing factor towards, or manifestation of, stress in their lives. Sadness is not assessed in the Affective component of the SF-MPQ, and it is thus not possible for the author to comment on whether the subjects in this study perceive this emotion as being pertinent to their pain experience.

The Stress Evaluation Inventory (SEI)

The SEI assesses the frequency of potentially stressful events in both the personal and family context of the subject's life. Both family and personal factors were shown to contribute to an almost equivalent level to the subjects' stress experience. These results do not, however, reflect whether these areas of stress are a cause or a consequence of the pain experience.

8.2.3 Appraisal

When evaluating pain attitudes, the SOPA revealed a very strong belief (83.78%) in medication being appropriate for the treatment of chronic pain. While medication is an appropriate component of the treatment for chronic pain, in the absence of effective analgesia and sufficient understanding of chronic pain management, such patients might seek additional medical treatment from various medical practitioners (Jensen et al., 1987). One of the most frequent pain attitudes in this sample, (as indicated by a mean percentage of 61.24%), is the belief that a medical cure exists for their pain problem. This is also a misperception, as chronic pain conditions are managed within a predominantly palliative rather than curative framework. Patients with this attitude might seek treatment from various medical physicians, and thereby avoid other necessary methods of interdisciplinary pain management (Jensen et al., 1987).

Another frequent misperception indicated by the results from the Harm subscale, is that pain signifies damage and that exercise and activities should thus be restricted. Chronic pain generally does not imply that damage is being done to the body, and appropriate exercise is necessary for effective pain management (Bonica, 1990; Shipton, 1993). A reasonably high mean of 56.48% was calculated for the belief that the subjects were unable to function because of their pain. Patients endorsing this view may resist seeking employment, additional methods of managing the pain, and may become increasingly dependent on the physician (Jensen et al., 1987).

Jensen et al., (1991) indicate that patients that have a more internal locus of control and believe that they have control over their pain have indicated better adjustment. In the current study, a mean of only 45.40% was calculated for the belief in a personal level of control over their pain. Patients who lack a sense of control over their pain may resist engaging in active, self-directive pain coping-strategies, for example exercise or relaxation (Jensen et al., 1987).

A relatively high mean of 56.35% was calculated for subjects believing that solicitous response from family members are appropriate when they are in pain. Appropriate dependence on others is an important factor in effectively managing chronic pain. It should, however, be noted that the belief that others are responsible for assisting one when one is experiencing pain, may limit the opportunity to acquire and practice adaptive behaviours (Jensen et al., 1987).

A mean of 57.87% was calculated for the belief in a relationship between the subjects' emotions and their pain intensity. This finding reflects the substantial contribution of the affective

component of the pain experience, as indicated by the affective dimension of the SF-MPQ.

In the context of Lazarus and Folkman's theory (1984a), the above findings indicate that subjects have appraised the pain experience to be one of potential harm and threat to their wellbeing. This is reflected by the predominantly negative appraisals that they attribute to the pain experience. A contributing factor towards misperceptions regarding the chronic pain experience may be the lack of information given to patients regarding the nature and management of this disease. The Parallel Processing Model of Pain would suggest that these negative appraisals are influenced by, and in turn have an influence on, the person's distress-schema (Dar & Leventhal, 1993). The negative appraisal is likely to contribute towards the stress level that is experienced by the person. It is also likely to influence the coping strategies that will be employed to manage the pain experience.

8.2.4 Coping

The results indicate that subjects employ predominantly emotion focussed, passive coping strategies, whereby they do not exert purposeful effort to manage the internal and external demands of the pain experience (Lazarus & Folkman, 1984a). Emotion focused coping generally predominates when the person feels that the stressful situation has to be endured (Folkman & Lazarus, 1980). The most common cognitive coping strategies employed by the subjects are praying or hoping that their pain will go away (70.70%) and the use of overt pain behaviours (66.14%). The subjects also used catastrophising thoughts and ideation reasonably frequently (46.88%).

Problem-focused coping tends to predominate when the person feels that something can be done to manage the stressful situation (Folkman & Lazarus, 1980). From an active, problem focused perspective, a reasonably high mean of 63.60% was calculated for the use of Coping Self-Statements, whereby subjects tell themselves that they can cope with the pain. Less frequent active strategies employed by the subjects include diversion of attention from the pain and engaging in active behaviours. The most infrequent strategies used by the subjects include ignoring the pain and reinterpreting the sensation.

From these findings, it could be deduced that while the subjects in this study use active methods of coping, passive and emotion focused strategies are more frequently employed in order to cope with their pain. These findings can be explained in terms of Lazarus and Folkman's theory, whereby negative appraisal about the pain experience would adversely influence the coping

strategies employed (Lazarus & Folkman, 1984a). The appraisals reflect harm, disability and the belief that the situation must be endured. This negative appraisal is manifest in predominantly passive emotion focused coping-strategies.

8.3 Discussion of hypotheses

8.3.1 Hypothesis I

There will be a positive relationship between pain intensity and the intensity of stress experienced by chronic pain patients.

A positive relationship between pain intensity and stress level is indicated by the correlation coefficients in Table 3a. This association between stress and pain reflects findings in previous research (Affleck et al., 1994; Fisher et al., 1996; Holmstrom et al., 1992; Jensen et al., 1994; Klapow et al., 1995; Penzien et al., 1993). These results can be conceptualised in terms of Lazarus and Folkman's theory of Stress, Appraisal and Coping (1984a). The person appraises the pain experience as one that exceeds his/her resources and endangers his/her wellbeing. The person thus experiences the pain as being stressful. The adverse influence of appraisal and affect on the stress experience in turn results in an increase in perceived pain intensity.

The Affect component of the SF-MPQ reflects the strongest correlations, when considering the various pain and stress measures. The Parallel-Processing Model of pain suggests that while the sensory and affective components of the pain stimulus are encoded simultaneously, each contribute independently towards the overall pain experience (Leventhal & Everhart, 1980). One might suggest that the patient's pain schema is associated with distress in light of the person appraising the pain experience as being unpleasant and stressful (Dar & Leventhal, 1993). If the patient has a negative pain-schema, then the negative emotions associated with the sensory pain experience will increase the patient's level of suffering, thereby adversely biasing his/her perception of the noxious stimulus.

While the relationship between pain and stress can be understood in terms of Lazarus and Folkman's theory, and can further be explained by the Parallel Processing Model of pain, the direction of the relationship is not indicated by these results. No causal factor can thus be confirmed by these correlations.

8.3.2 Hypothesis II

There will be a positive relationship between pain intensity and the intensity of negative appraisal in a chronic pain population. Conversely, there will be a negative relationship between pain intensity and the intensity of positive appraisal in a chronic pain population.

A positive relationship between pain intensity and negative appraisal is reflected by the correlations in Table 3b. When pain intensity is correlated with Disability, Harm, Medication and Solicitude respectively, a positive relationship of weak to moderate strength is indicated. This positive association between pain and negative appraisal is reflected in previous research (Jensen et al., 1991; Jensen et al., 1994; Lin, 1998; Jensen & Karoly, 1992; Lin & Ward, 1996). A weak negative relationship is indicated when pain intensity is correlated with Control. Control is considered to be a positive appraisal, since this reflects taking responsibility for one's own choices and behaviour (Gibson & Helme, 2000). The inversely proportional relationship between Control and pain intensity reflects findings by Gibson and Helme (2000), Toomey et al. (1991) and Geisser et al. (1994a).

No conclusion can be drawn regarding the relationship between pain intensity and the belief that a medical cure exists for one's pain problem. While the correlation between these variables is positive, this relationship is extremely weak and is not significant.

There appears to be a relationship between both the Sensory as well as the Affective components of the pain experience, when these two dimensions from the SF-MPQ are correlated with subscales from the Survey of Pain Attitudes. On average, the Present Pain Intensity and the Numerical Rating Scale correlations with variables from SOPA were in the same direction, but weaker than the Sensory and Affective dimensions of the SF-MPQ. The Numerical Rating Scale reflected the weakest relationships, with the lowest level of significance, as compared to the other pain measures. For completion of the PPI, the subject is presented with a list of descriptors that have emotional connotations. The influence of the affective component of pain towards the overall pain experience may account for the higher score ratings on the PPI, as compared to the Numerical Rating Scale. A disadvantage of the Numerical Rating Scale is the assumption that pain is unidimensional in nature. The multidimensional nature of pain includes both sensory and affective aspects (Leventhal & Everhart, 1980).

The Affective component of the pain experience, the Numerical Rating Scale and the Present Pain Intensity reflect stronger correlations with Control than the Sensory dimension of the SF-MPQ. This finding may indicate that a substantial level of affect is associated with the level of perceived control over the pain experience, and that pain intensity is in turn biased by emotion. The subjects' perception of having a level of control over their pain, may influence them emotionally, and thus adversely affect their pain intensity. Since no causality is indicated by the correlation, this explanation cannot be considered to be conclusive.

The greater the belief in taking medication, the greater the intensity of the Sensory and Affective components of the pain experience, or vice versa in light of no causality being indicated. Similarly, the greater the perceived requirement for solicitous responses when one is in pain, the greater the intensity of the Sensory and Affective components of the pain, or vice versa. Reliance on medication, doctors and family members in order to manage the pain, suggests an external locus of control. The negative affect in turn enhances the overall intensity of pain experienced by the subject. This explanation is reflected in the correlation between control and pain intensity. The lower the level of perceived control over the pain experience, the greater the intensity of the Sensory and Affective components of pain intensity reported by the subjects. Alternatively, the greater the pain intensity, the lower the level of perceived control over the experience.

A proportional relationship was found between the level of perceived disability and the intensity of the Sensory as well as Affective component of the pain experience. It was also found that the greater the level of perceived harm being done to the body as a consequence of the pain, the greater the intensity of the Sensory as well as the Affective component of the pain experience, or vice versa. These negative attitudes and misperceptions have been shown to have an adverse effect on the subjects' pain intensity.

A positive correlation was found between the perception of emotion impacting the pain experience and the intensity of the sensory as well as the affective components of the pain. This finding can be explained in terms of the Parallel Processing Model, whereby affect is seen to be an integral and influential component of the pain experience (Dar & Leventhal, 1993). If the subject focuses on the affective component of the pain experience, this is likely to increase his/her perceived level of pain intensity, or vice versa since no direction of causality is indicated in this relationship.

The above findings can be further understood in terms of Lazarus and Folkman's theory of Stress, Appraisal and Coping (Lazarus & Folkman, 1984a). Vulnerability influences appraisal and is dependent on physical, psychological and social resources for coping (Lazarus & Folkman, 1984a). The pain patient perceives his/her personal and environmental resources as being overwhelmed, and he/she is therefore likely to experience a substantial level of vulnerability (Lazarus & Folkman, 1984a). While the relevance of a situation can motivate the person towards taking positive action in order to manage the circumstances, results indicate a substantial level of passive acceptance of the pain experience.

The way that the subject appraises his/her pain experience will define the personal meaning of the encounter for his/her wellbeing (Lazarus & Folkman, 1984a). The pain experience is appraised as adversely affecting the subjects' personal goals, and therefore has a level of motivational relevance for them. The subjects' motivational congruence is also adversely affected, as the pain experience is not congruent with their personal goals (Lazarus & Folkman, 1984a). In light of these two motivational factors, during the primary appraisal process, the subject realises that the chronic pain experience implies potential harm to his/her wellbeing.

According to Lazarus and Folkman (1984a), the extent to which a person believes that he/she is able to control the environment and his/her response to the stressor, will influence his/her emotional reaction and ability to cope. Research suggests that appraising a situation as controllable is stress reducing (Lazarus & Folkman, 1984a). In this study, control is shown to have a negative relationship with pain intensity. If stress is seen to have a positive correlation with pain intensity, it could possibly be extrapolated that control has a negative relationship with stress. This relationship was not tested in this research, however such a question may prove to be useful for future research.

From a secondary appraisal perspective, the subject will evaluate whether anything can be done to overcome or prevent further harm (Lazarus & Folkman, 1984a). While this process includes an evaluation of what coping strategies may be employed, the SOPA assesses attitudes rather than coping strategies. With reduced perceived level of control over their pain, the subjects have a tendency to lack responsibility for managing their own experience, as is reflected by the positive relationship between solicitous responses and pain intensity.

Future expectancy relates to whether the psychological situation can be changed to make it less or more motivationally congruent (Lazarus & Folkman, 1984a). The results do not indicate a tendency for the chronic pain patients in this study to make their experience more motivationally congruent. This is reflected in the general finding of a positive relationship between pain intensity and negative appraisal, and a negative relationship between pain intensity and positive appraisal in this chronic pain population. Secondary appraisal also includes an evaluation of what the outcome of their such action would possibly achieve (Lazarus & Folkman, 1984a). It appears as if the subjects in this study passively accept their circumstances rather than attempting to actively alter their situation. This relationship will be discussed in further detail in the following section on coping in the current chronic pain population.

Lazarus and Folkman (1984a) consider the properties of novelty and event uncertainty as situation factors that may influence an appraisal of threat, harm or challenge. While the chronic pain experience may be novel and hold a level of uncertainty for the subject, he/she is likely to have a pre-existing system of schematised and abstracted knowledge that will be utilised in an effort to create an understanding and meaning of this experience (Dar & Leventhal, 1993; Lazarus & Folkman, 1984a). It is likely that the subjects have insufficient knowledge of chronic pain and the management thereof, to enable adequate coping. Awareness of this coping deficit may contribute towards negative appraisal and thereby also increase stress and pain intensity.

8.3.3 Hypothesis III

There will be a positive relationship between pain intensity and the frequency of employing passive coping-strategies, in a chronic pain population. There will be a negative relationship between pain intensity and the frequency of employing active coping-strategies, in the present chronic pain population.

For the purpose of this thesis, Diverting Attention, Reinterpreting Pain sensations, Coping Self-Statements, Ignoring Pain Sensations and Increasing Activity Level are considered to be active, problem-focused strategies. Praying/Hoping, Catastrophising and Increased Pain Behaviours are classified as passive strategies. Brown and Nicassio (1987) suggest that active strategies are generally adaptive whereas passive strategies tend to be maladaptive.

Although reasonably weak, the correlations are strongest between the Affective component of the pain experience and the various coping strategies, as compared to the sensory pain measurements. One can explain this relationship in terms of Lazarus and Folkman's (1984a) bi-directional model of emotion and coping, each affecting one another. Negative appraisal will generate emotion, and both of these factors will influence the coping process. This relationship can further be understood in light of the Parallel Processing Model of Pain, which indicates that the affective component of the pain experience substantially influences the overall pain experience (Leventhal & Everhart, 1980). It should be noted that while Lazarus and Folkman's theory (1984a) provides a conceptual framework in which these findings can be explained, the direction of causation of relationships could not be determined.

Present Pain Intensity is more strongly correlated with the respective coping strategies than the Numerical Rating Scale scores. This can possibly be explained in terms of the subject's evaluation of his/her pain experience at the time of the interview being substantially influenced by affect. It is also possible that subjects provide a more accurate measure of their pain when presented with descriptors in order to rate their experience. For the PPI, the subject is presented with adjectives that have emotional connotations. If one considers the bi-directional nature of affect and coping, the correlation between the PPI and the respective coping strategies becomes understandable.

Of all the coping strategies measured by the Coping Strategies Questionnaire, only Coping Self-Statements, Catastrophising and Increasing Activity Level were shown to have significant relationships with all the measures of pain, other than the Numerical Rating Scale. These findings will be discussed in greater detail.

There is a negative relationship of moderate strength between pain intensity and the use of Coping Self-Statements, for all pain measures other than the Numerical Rating Scale. This correlation implies that the more the subjects tell themselves that they can cope with the pain, the lower their perceived sensory and affective pain intensity, or vice versa in light of no causality being indicated. Research findings by Haythornwaite et al. (1998) and Hill (1993) reflect this inversely proportional relationship between Coping Self-Statements and pain intensity. It should be noted that while research regarding the relationship between these two variables remains equivocal, literature suggests the likelihood of this coping strategy being more adaptive than maladaptive (Boothby et al., 1999). With respect to Lazarus and Folkman's theory (1984a),

Coping Self-Statements may aid the person in appraising the pain experience in a relatively favourable manner, positively influencing the person's affect. If one considers the bi-directional relationship between affect and coping, it could be suggested that the subjects' coping strategies would thus be positively influenced.

There is a positive relationship of moderate strength, between pain intensity and Catastrophising. This implies that the more a subject makes negative self-statements, and has catastrophising thoughts and ideation, the higher his/her perceived intensity of pain, from both a sensory and affective perspective, or vice versa in light of no causality being indicated. The affect component of this relationship can be understood in terms of negative appraisal and affect having a bi-directional influence on each other. This in turn will influence the person's coping strategies. It is suggested that the pessimistic schema of the pain experience culminate in the person feeling a need to endure the chronic pain rather than actively attempting to manage it. The latter is manifest in passive, emotion-focused coping strategies. Results regarding the proportional relationship between pain intensity and Catastrophising confirm previous research findings (Geisser et al., 1994a; Harkapaa, 1991; Hill, 1993; Hill et al., 1995; Lefebvre et al., 1995; Sullivan et al., 1995; Ulmer, 1997; Wilkie & Keefe, 1991). In conclusion, Catastrophising is a passive, emotion focused coping-strategy, and can be considered to be maladaptive in light of its negative influence on pain intensity.

There is a negative relationship of moderate strength between pain intensity and Increasing Activity Level. In other words, the more a subject engages in active behaviours that direct his/her attention away from the pain, the lower the perceived pain intensity. Brown and Nicassio have described an increase in activity level as being adaptive (1987). Jensen et al., (1991) state that better adjustment has been associated with active coping strategies, which include an increase in activity level. However, owing to analysis being predominantly composite, individual subscale data is not available (Jensen et al., 1991). The inversely proportional relationship between pain intensity and activity level can nonetheless be understood in terms of the accepted view of exercise being central to the effective management of chronic pain (Bonica, 1990; Melzack & Wall, 1994; Shipton, 1993).

When Diverting Attention and Ignoring Pain Sensations are correlated with both the Affect dimension of the SF-MPQ and with the Present Pain Intensity score respectively, a negative relationship of moderate strength is indicated. In other words, the more that subjects think of

things that serve to distract them away from their pain, or the more that they deny that pain affects them, the lower their perceived pain intensity, or vice versa in light of no causality being indicated. Both of these coping strategies are considered to be active and problem-focused. Literature indicates that these strategies are adaptive (Brown and Nicassio, 1987). However, most researches have failed to establish a significant relationship with the use of distraction and pain interference with pain severity in chronic pain patients (Boothby et al., 1999). Also, in the majority of cases, Ignoring Pain Sensations does not seem to have a significant association with pain intensity (Boothby et al., 1999). In the context of Lazarus and Folkman's theory (1984a), one could suggest that these coping strategies detract from the focus on negative appraisal and affect regarding the pain experience. This in turn may positively influence the method of coping with the pain.

Some studies have shown that Reinterpreting Pain Sensations resulted in reports of lower pain levels (Buckelew, et al., 1992; Kuile et al., 1995). However, Boothby et al. (1999) found that overall, reinterpreting pain sensations was not associated with significant differences in pain severity. The latter was reflected in data from the current study, as can be seen in Table 3c.

There is no significant relationship indicated between pain intensity and either Praying/Hoping or Increased Pain Behaviour. This is an interesting finding in light of these two coping strategies being amongst the most common strategies employed by the pain patients in this study (Refer to Table 2e). If one evaluates the lack of impact of these coping methods on pain intensity, one can deduce that such strategies are ineffective in decreasing the subjects' pain intensity. Research findings with respect to the relationship between pain intensity and either Praying/Hoping or Increasing Pain Behaviour, is limited and equivocal (Boothby et al., 1999; Geisser et al., 1994a; Keefe et al., 1990).

In summary, data from the current research indicate that a negative relationship exists between pain intensity and the frequency of active coping-strategies being employed. These relationships are strongest when the respective strategies are correlated with the affective dimension or the PPI, from the SF-MPQ. Both of these pain measures provide the subject with emotive words that describe the pain experience. In the context of Lazarus and Folkman's theory (1984a), these results reflect the bi-directional relationship between affect and coping. The Parallel Processing Model of Pain sheds further light on this finding, in that it emphasises the impact of affect on the overall pain experience (Dar & Leventhal, 1993). Positive appraisal and affect is likely to result

in adaptive coping, and consequently have a positive effect on pain intensity. Conversely, a negative relationship was yielded between pain intensity and passive coping strategies. Catastrophising was shown to have a correlation of moderate strength with pain intensity. Negative appraisal and affect are likely to result in maladaptive coping, culminating in increased pain intensity. The other passive coping-strategies did not reflect any significant relationships with pain intensity.

8.3.4 Limitations and suggestions for future research

Various limitations to the current study will be presented in order to provide a context for the interpretation and extrapolation of the above-mentioned findings. Recommendations for future research in the field of stress, coping and appraisal in the context of chronic pain will also be suggested.

One of the challenges of clinical research is the difficulty in gaining a representative sample. The convenience nature of the sample as well as the relatively small number of subjects included in the research, limit the generalisability of the results.

Despite the importance of stress, coping and appraisal being acknowledged as relevant contributing factors to the pain experience, existing instruments for the assessment of these variables require further investigation. While the SACPQ demonstrates acceptable internal reliability for the current sample, no local norms exist for the respective measures within this questionnaire. The adaptation of the questionnaire was rationally based, and extrapolation of the findings may thus be limited. There is a need for the validity of the SACPQ to be investigated.

The current study classifies chronic pain as one disease entity, and therefore does not comment on the specific aetiology of the respective conditions. An interesting study may be to assess the impact of stress, coping and appraisal across various chronic pain conditions. Further research should also possibly incorporate length of illness as an independent variable.

There is a scarcity of data that evaluates the relationship between chronic pain and stress per se. In light of stress having an influential role on the chronic pain experience, further research in this field is necessary. Also, the causal factor of the stress is not measured by the PSQ, and pain may be one of various factors contributing towards the pain experience. Possible confounding variables that were not assessed in this study include employment status and whether the

unemployed subject received disability grant or workman's compensation. The latter variables may pose as significant stressors, thereby biasing the subjects' pain experience.

The current research highlights the methodological difficulty of differentiating between stress and coping acting as either dependent or independent variables. Also, in light of the correlational nature of the findings, causal inferences cannot be drawn. Thus, while results have been interpreted in the framework of Lazarus and Folkman's theory, the direct influence of stress, appraisal and coping on pain intensity is not necessarily reflected in the results. Further research is required in order to establish whether stress, appraisal and coping are cause or effect of chronic pain. Longitudinal studies might be a useful way of determining this cause-effect association. A future area of research could possibly be to investigate the bi-directional relationship between these variables, and the consequent difficulty in defining one factor as being the consistent cause of the other.

In so far as stress, coping and appraisal have been shown to be important aspects of the chronic pain experience, the findings of this study may have relevance for clinical intervention. Modification of these factors is likely to enhance the outcome of treatment (Bonica, 1990; Shipton, 1993). Understanding the direction of causation is necessary in order to enhance the clinical implications of these findings.

As indicated earlier in this chapter, the findings in this study confirm previous research and endorse the likelihood of stress, appraisal and coping having a significant effect on the patient's pain intensity. Additional research is necessary in order to identify the mechanisms associating these variables with perceived pain intensity.

Nicassio and Brown (1987) state that active coping strategies have been associated with better adjustment, whilst passive strategies have been associated with poorer outcomes. If one considers pain severity to be an indication of adjustment, it can be deduced that since there is a positive relationship between passive coping strategies and pain intensity, the subjects in this study have not adjusted effectively to their pain experience. Future research is necessary in order to explore the relationship of adjustment to stress, appraisal and coping, in chronic pain patients. Such research has potentially important implications for clinical intervention in the field of chronic pain.

Finally, literature suggests that culture may play an influential role in the chronic pain experience (Helman, 1994). In light of South Africa being a society with substantial cultural diversity, the impact of culture on the chronic pain patient in this country, may prove to be a relevant area of research.

8.3.5 Conclusion

The aim of the study was to broadly investigate the application of Lazarus and Folkman's Theory of Stress, Appraisal and Coping, to the chronic pain experience. More specifically, the researcher investigated the impact of stress, appraisal and coping on pain intensity in a chronic pain population.

A proportional relationship between pain intensity and stress level was indicated in the current chronic pain population. A positive relationship between pain intensity and the intensity of negative attitudes was revealed. A positive relationship was also reflected between pain intensity and the employ of passive, emotion-focused coping-strategies. The results in this study confirm the findings of previous research and endorse the influential role of stress, appraisal and coping on the pain experience. While association between pain intensity and aspects of stress, appraisal and coping has been found, the direction of causation has not been resolved in this study.

Lazarus and Folkman's theory has provided a broad theoretical framework in which to conceptualise the impact of stress, appraisal and coping on pain intensity in a chronic pain population. There are, however, limitations to the generalisability of these findings. Appraisal, emotion and coping interact consistently, having an impact on the level of stress. In light of pain being perceived as a stressor, these variables are likely to impact the pain experience. The current research highlights the methodological difficulty of differentiating between stress and coping acting as either dependent or independent variables. Data may also be biased in light of the bi-directional relationship that exists between emotion and coping. Thus, the direct influence of stress, appraisal and coping on pain intensity is not necessarily reflected in these results.

In conclusion, despite the limitations of this research, findings provide tentative evidence for the impact of stress, appraisal and coping on pain intensity, in the current chronic pain population. These results also provide partial support for the application of Lazarus and Folkman's theory to the chronic pain experience.

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APPENDIX 1

SOUTH AFRICAN CHRONIC PAIN QUESTIONNAIRE (SACPQ)

PART I

Date:

Name:

Home address:

.....

Postal address:

.....

Home phone number: Work phone number:

First language: English; Afrikaans; Xhosa; Zulu; Other

Sex: Male/Female

Date of birth:

Ethnic group: White; Coloured; Black; Asian; Other

Where is your pain?

.....

For how long have you had your pain?

What is the medical explanation for your pain?

.....

Are you currently taking pain medication? Yes/No

Are you currently receiving psychiatric medication? Yes/No If yes, what is the reason for your taking this medication:

.....

Have you attended sessions in any of the following areas during the past five years:

- Psychotherapy (Yes/No)
- Pain management (Yes/No)
- Coping skills (Yes/No)
- Life skills (Yes/No)

PART II**WHAT DOES YOUR PRESENT PAIN FEEL LIKE?**

	NONE	MILD	MODERATE	SEVERE
THROBBING				
SHOOTING				
STABBING				
SHARP				
CRAMPING				
GNAWING				
HOT - BURNING				
ACHING				
HEAVY				
TENDER				
SPLITTING				
TIRING - EXHAUSTING				
SICKENING				
FEARFUL				
PUNISHING - CRUEL				

WHAT IS THE INTENSITY OF YOUR PAIN AT PRESENT?

0	NO PAIN	
1	MILD	
2	DISCOMFORTING	
3	DISTRESSING	
4	HORRIBLE	
5	EXCRUCIATING	

WHAT IS THE AVERAGE INTENSITY OF PAIN THAT YOU HAVE EXPERIENCED DURING THE PAST WEEK?

0 6
No pain Worst possible pain

PART IV

On a scale of zero to six, where zero is “never applies to me” and six is “always applies to me”, please write a number in the box next to each statement that shows how you rate it in terms of your own recent life experience:

.....

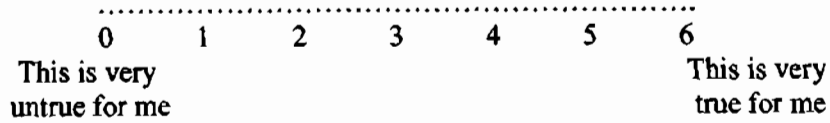
0 1 2 3 4 5 6

Does not apply to me Always applies to me

1	I constantly seem to have problems getting along with members of my family	
2	I prefer to spend less time with my friends now than I did before	
3	The demands made on me by my family are very stressful	
4	Many of the people I meet during the week seem to make me anxious and upset	
5	I have heated arguments with at least one member of my family	
6	Most relationships with other people are very demanding of my time and effort	
7	My living situation is strained and tense	
8	I wish that I could change my personal relationship with a member of my family	
9	The type of life I presently lead interferes with my family activities	
10	Lately, I have been losing my temper more often than usual	
11	At present, it would require a lot of effort on my part to make new friends	
12	Overall, I have trouble meeting the demands placed on me by each day's activities	
13	Just being pleasant to friends is getting very hard for me	
14	At present, my personal finances are somewhat strained	
15	I get bored because I have too much leisure time on my hands	

PART V

On a scale of zero to six, where zero is “this is very untrue for me” and six is “this is very true for me”, please write the number in the block next to each statement showing how much you agree with each of the following statements about your pain:



1	The pain I usually experience is a signal that damage is being done	
2	I do not consider my pain to be a disability	
3	Nothing but my pain really bothers me	
4	My family does not understand how much pain I am in	
5	I count more on my doctors to decrease my pain than I do on myself	
6	I will probably always have to take pain medications	
7	When I hurt, I want my family to treat me better	
8	I do not expect a medical cure for my pain	
9	Pain does not necessarily mean that my body is being harmed	
10	I have had the most relief from the pain with the use of medications	
11	Anxiety increases the pain I feel	
12	There is little that I or anyone can do to ease the pain I feel	
13	When I am hurting, people should treat me with care and concern	
14	I pay doctors so that they will cure me of my pain	
15	It is the responsibility of my loved ones to help me when I feel pain	
16	Stress in my life increases my pain	
17	Exercise and movement are good for my pain problem	
18	Just by concentrating or relaxing, I can “take the edge” off my pain	
19	I will get a job to earn money regardless of how much pain I feel	
20	My family needs to learn to take better care of me when I am in pain	
21	Depression increases the pain I feel	
22	I believe I can control how much pain I feel by changing my thoughts	
23	I wish my doctor would stop prescribing pain medications for me	
24	Something is wrong with my body which prevents much movement or exercise	
25	My pain does not stop me from leading a physically active life	
26	My physical pain will never be cured	
27	If I do not exercise regularly, my pain problem will continue to get worse	
28	I am in control of my pain	
29	No matter how I feel emotionally, my pain stays the same	
30	Pain will never stop me from doing what I really want to do	
31	When I find the right doctor, he or she will know how to reduce my pain	
32	If my doctor prescribed pain medications for me, I would throw them away	
33	Whether or not a person is disabled by pain depends more on your attitude than the pain itself	
34	I have noticed that if I can change my emotions, I can influence my pain	
35	I will never take pain medications again	

SUID AFRIKAANSE CHRONIESE PYN VRAELYS (SACPV)

DEEL I

Datum:

Naam:

Huisadres:

Posadres:

Huis telefoon nommer: Werk telefoon nommer:

Huistaal: Engels; Afrikaans; Xhosa; Zulu; Ander

Geslag: Mans/Vrouens

Geboortedatum:

Etniese groep: Wit; Kleurling; Swart; Asiaat, Ander

Waar is u pyn?

Hoe lank het u al die pyn?

Wat is die mediese verklaring vir u pyn?

Neem u tans enige medikasie vir pyn? Ja/Nee

Ondergaan u tans psigiatriese medikasie? Ja/Nee Indien wel, wat is die rede waarom u hierdie medikasie neem?

Het u sessies in enige van die volgende velde die afgelope vyf jaar bygewoon?

- Psigoterapie (Ja/Nee)
- Pynbeheer (Ja/Nee)
- Lewenshantering (Ja/Nee)
- Lewensvaardighede (Ja?Nee)

DEEL II**HOE VOEL U PYN OP DIE OOMBLIK VIR U?**

	NIKS	LIG	MATIG	ERG
KOPPEND				
SKIETEND				
STEKEND				
SKERP				
KRAMPEND				
VRETEND				
WARM/ BRANDEND				
KNAEND				
SWAAR				
GEVOELIG				
SKEUREND				
VERMOEIEND/ MERGELEND				
MAAK MY NAAR				
VREESAANJAEND				
STRAF/ ONMENSLIK				

HOE ERG IS U PYN TANS?

0	NIKS	
1	LIG	
2	ONGEMAKLIK	
3	ERG VERSTEUREND	
4	VERSKRIKLIK	
5	ONUITHOUDBAAR	

HOE WAS U PYN DIE AFGELOPE WEEK AS GEHEEL?

.....

0 1 2 3 4 5 6

Niks pyn nie Die ergste moontlike pyn

DEEL IV

Op 'n skaal van nul tot ses, waar nul beteken "nooit op my van toepassing nie", en ses beteken "altyd op my van toepassing", bul 'n nommer in die blokkie langs elke stelling in wat toon hoe u dit evalueer in terme van u eie onlangse lewensondervinding:

.....

0	1	2	3	4	5	6
Nooit op my van toepassing nie				Altyd op my van toepassing		

1	Dit lyk of ek altyd probleme het om met my familie oor die weg te kom	
2	Ek verkies om minder tyd met vriende deur te bring as voorheen	
3	My familie stel te strawwe vereistes aan my	
4	Baie van die mense wat ek in die week ontmoet, maak my angstig en ontsteld	
5	Ek voer hewige argumente met ten minste een familielid	
6	Die meeste menseverhoudings vereis te veel van my tyd en energie	
7	My lewensomstandighede is gespanne	
8	Ek wens ek kon my persoonlike verhouding met een van my familieleden verander	
9	Die lewe wat ek tans lei, meng in met familie-aktiwiteite	
10	Ek verloor deesdae my humeur meer as gewoonlik	
11	Dit is tans vir my groot moeite om nuwe vriende te maak	
12	Ek sukkel om te voldoen aan die vereistes van my daaglikse aktiwiteite	
13	Dit raak vir my selfs moeilik om vriendelik teenoor vriende te wees	
14	Op die oomblik is my persoonlike finansies ietwat benard	
15	Ek raak verveeld omdat ek te veel vrye tyd het	

DEEL V

Op 'n skaal van nul tot ses, waar nul beteken "dit is glad nie waar vir my nie", en ses beteken "dit is baie waar vir my", vul 'n nommer in die blokkie langs elke stelling in wat toon in hoeverre u saamstem met elkeen van die volgende stellings oor u pyn:

	
	0 1 2 3 4 5 6	
Dit is baie onwaar vir my		Dit is baie waar vir my

1	Die pyn wat ek gewoonlik kry is 'n teken dat skade gedoen word	
2	Ek beskou nie my pyn as 'n gestremdheid nie	
3	Niks pla my eintlik nie, behalwe my pyn	
4	My familie verstaan nie hoeveel pyn ek het nie	
5	Om my pyn te verlig, maak ek meer op my dokters staat as op myself	
6	Ek sal waarskynlik altyd pynpille moet neem	
7	Wanneer ek seerkry, wil ek hê my familie moet my beter behandel	
8	Ek verwag nie 'n mediese genesing vir my pyn nie	
9	Pyn beteken nie noodwendig dat my liggaam beskadig word nie	
10	Ek kry nie meeste pynverligting as ek middels neem	
11	Angstigtheid vermeerder die pyn wat ek voel	
12	Daar is min wat ek of enigiemand anders kan doen om die pyn wat ek voel te verlig	
13	Wanneer ek seerkry, moet mense my met sorg en besorgheid behandel	
14	Ek betaal dokters/die hospitaal sodat hulle my pyn moet verlig	
15	Dit is my geliefdes se verantwoordelikheid om my te help as ek pyn voel	
16	Spanning in my lewe maak my pyn erger	
17	Oefening en beweging is goed vy my pyn-probleem	
18	Deur net te konsentreer of ontspan kan ek die pyn minder skerp maak	
19	Ek sal 'n betalende werk kry, ongeag van hoeveel pyn ek voel	
20	My familie moet leer om beter vir my te sorg wanneer ek pyn het	
21	Teneergedruktheid vermeerder die pyn wat ek voel	
22	Ek glo ek kan die mate van pyn wat ek voel, beheer deur my gedagtes te verander	
23	Ek wens die dokter sal ophou om pynpille vir my voor te skryf	
24	Daar is iets met my liggaam verkeerd wat veel beweging of oefening verhoed	
25	My pyn keer nie dat ek 'n fisies aktiewe lewe lei nie	
26	My fisies pyn al nooit genees word nie	
27	As ek nie gereëld oefen nie, sal my pynprobleem aanhou erger word	
28	Ek is nie in beheer van my pyn nie	
29	Dit maak nie saak hoe ek emosioneel voel nie, my pyn bly dieselfde	
30	Pyn sal nooit keer dat ek doen wat ek regtig wil nie	
31	Wanneer ek die regte dokter vind, sal hy/sy weet hoe om my pyn te verminder	
32	As my dokter pynpille voorskryf, sal ek hulle weggooi	
33	Of mens deur pyn gestrem word, hang af meer van jou houding as van die pyn self	
34	Ek het al opgelet dat as ek my gevoelens kan verander, ek my pyn kan verander	
35	Ek sal nooit weer pynpille neem nie	

DEEL VI

Op 'n skaal van nul tot ses, waar nul beteken “ek doen dit nooit nie”, en ses beteken “ek doen dit altyd”, vul 'n nommer in die blokkie langs elke stelling in wat die mees akkuraat toon wat u doen wanneer u pyn ondervind:

.....

0	1	2	3	4	5	6
Ek doen dit nooit nie						Ek doen dit altyd

Wanneer ek pyn voel.....

1	Probeer ek aan iets anders dink	
2	Is dit verskriklik en voel ek dat ek nooit beter sal word nie	
3	Sê ek vir myself dat ek die pyn kan oorwin	
4	Neem ek my pynmedikasie	
5	Dink ek daaraan as iets anders, soos 'n dooie gevoel	
6	Voel ek dit is nie die moeite werd om te lewe nie	
7	Stap ek baie	
8	Ontspan ek of gaan lê ek	
9	Dink ek nie aan die pyn nie	
10	Dink ek jare vorentoe, hoe dinge sal wees na ek van die pyn ontslae is	
11	Vetel ek myself dat dit nie seer is nie	
12	Sê ek dat ek nie mag toelaat dat die pyn my keer om te doen wat ek moet nie	
13	Vertrou ek in dokters, dat daar eendag 'n genesing vir my pyn sal wees	
14	Maak ek asof dit nie daar is nie	
15	Dink ek aan mense wie se geselskap ek geniet	
16	Verbeel ek my dat die pyn buite my liggaam is	
17	Hou ek maar aan, al is dit seer	
18	Probeer ek om mense om my te hê	
19	Vetrou ek op my geloof in God	
20	Voel ek dat ek nie verder kan nie	
21	Dink ek aan die dinge wat ek geniet om te doen	
22	Doen ek iets wat ek geniet, soos TV kyk, lees of musiek	
23	Maak ek asof dit nie deel is van my nie	
24	Doen ek iets aktief, soos huiswerkies	