

Chapter 3

INFLUENCE OF BREAKTHROUGH PAIN PSYCHOLOGICAL FACTORS AND ADJUSTMENT

Overview of Study

This phase of the research has a quantitative aspect (reported in Chapter 3-4 as Studies 2- 3) and a qualitative aspect (reported in Chapter 5 as Study 4). This chapter reports a second empirical study among advanced cancer patients who are experiencing pain. Relationships were found between predictors and two dimensions of adjustment (quality of life and coping) in Study 1. Only one outcome variable was able to be explored because of the need to reduce patient burden. Although further exploration of factors influencing quality of life is warranted, the gap in existing literature is greater for coping. Therefore, it was decided that this thesis would continue its focus on relationships with coping and not quality of life.

To recap, pain is commonly reported by patients with advanced cancer and affects their adjustment (Bennett et al., 2005; Ferrell 2000; Schwarzer & Knolls, 2009; Turk et al., 1998). The previous study did not discriminate between types of pain. Because breakthrough pain is a particularly distressing type of cancer pain, the second study limited the focus to the characteristics of breakthrough pain in order to explore relationships between pain characteristics, psychological factors and adjustment.

The present study proposed to extend Study 1 by addressing three limitations. First, all measures were patient-reported. Second, it extended the measurement of the pain characteristics to include duration, which has been previously identified as important to adjustment (Zeppetella, O'Doherty & Collins, 2000).

Third, data used in Study 1 were old and drawn in the USA. Focusing on an Australian palliative population would address a local need. There has been relatively little psychological research in palliative care conducted with the current unique community context found in Australia.

The present study therefore used a recent sample of Australian cancer patients who were receiving palliative care, and extended Study 1 by examining whether psychological factors other than emotion are also related to adjustment. Two psychological factors were investigated: meaning of pain and perceived effectiveness of pain management strategies.

Experience of Pain

Despite medical advances, pain remains a serious problem for cancer patients receiving palliative care (Fine et al., 2008; Green, 2009). In Study 1, more than half of the patients reported pain. Moreover, among these patients, who experienced pain, approximately one quarter reported distressing levels of pain intensity and one third experienced frequent pain. Pain that is frequent and intense may be “breakthrough pain.” Breakthrough pain has been identified as a particular problem in palliative care (Bhatnagar et al., 2010; Bruera, 1997; Fine et al., 2008; Portenoy & Hagen, 1990; Zeppetella et al., 2000).

Breakthrough Pain

There have been a number of different definitions of breakthrough (or “episodic”) pain. The definition used in this thesis is that breakthrough pain is a transitory exacerbation of pain that occurs in addition to otherwise stable persistent pain

(Portenoy & Hagen, 1990; Mercadante et al., 2002). The etiology of breakthrough pain is often the same as background pain and may be due to direct or indirect effects of underlying disease, treatment, or concomitant disease or injury (Portenoy & Hagen, 1990; Zeppetella et al., 2000, Zeppetella & Ribeiro, 2003).

Breakthrough pain has been classified into two categories: spontaneous or idiopathic pain (in which the episodes are not related to an identifiable precipitant and are therefore unpredictable in nature), and incident or precipitated pain (in which the cause can be identified). Precipitating events may include volitional acts (e.g., urination, walking), a non-volitional event (e.g., coughing, laughing) or procedural events (e.g., wound dressing, end-of-dose failure) (Davies et al., 2008; Portenoy & Hagen, 1990). Such distinctions are not central to the current study. Instead, the study focuses on the prevalence of breakthrough pain and its characteristics (intensity, frequency and duration).

Prevalence of breakthrough pain. Breakthrough pain is more commonly reported during the advanced stages of cancer (Colleau, 2004). There are widely varying reports about the prevalence of breakthrough pain among cancer patients. These range from 19% to 95% (Bhatnagar, 2010; Fine et al., 2008; Portenoy & Hagen, 1990; Portenoy, Payne & Jacobsen, 1999). In addition, there are geographic differences in breakthrough pain prevalence. A greater prevalence of breakthrough pain has been reported by researchers in the USA, Canada, Australia and Northwestern Europe than in South American, Asian and South-eastern European countries (Caraceni & Portenoy, 1999; Caraceni, 2004).

Four reasons may explain the wide variation and regional variations in reported prevalence of breakthrough pain. First, different ways of measuring breakthrough pain have been employed. There is no standard breakthrough pain assessment tool for cancer patients (Haugen et al, 2010; Jensen & Karoly, 2001) and therefore different instruments or adaptations of these instruments have been used. What appear to be differences in prevalence may be an artefact of use of different measures. Second, patients show poor compliance to requests to record episodes of breakthrough pain (Caraceni, 2004), especially if they have severe pain (de Wit et al., 1999). Third, patients may experience different levels of breakthrough pain as a result of receiving different treatment protocols. For example, patients have greater access to opiate medication in some countries than others. It is noteworthy that higher prevalence rates for breakthrough pain have been reported in countries where access to opiate medication is readily available. Fourth, there may be differences in reporting pain even when the experience of pain is similar. Individuals and cultures may differ in judgements about the appropriateness of acknowledging or reporting that one is in pain. Even in contexts in which breakthrough pain has a relatively low prevalence, researchers acknowledge it is not effectively controlled, and is still a serious clinical problem (e.g., Bhatnagar et al., 2010, Green et al., 2010; Hagen et al., 2008).

Little is known about the prevalence of breakthrough pain among cancer patients currently receiving palliative care in Australia, where the unique medical system provides universal free or highly subsidised access to palliative care services through Medicare and the Pharmaceutical Benefits Scheme (PBS). This thesis reports the prevalence and characteristics of breakthrough pain in an Australian

palliative care service. This information will assist us to understand and compare the experience of breakthrough pain in Australia and to compare its prevalence with that in other countries with similar services (e.g., Canada, UK, Western Europe) and with countries without universal access to services (e.g., USA, other parts of the world).

Adjustment to Pain

The present study focuses on the influence of two psychological factors (meaning of pain, perceived effectiveness of pain management strategies) on adjustment in the context of breakthrough pain. It also aimed to explore the influence of these psychological factors on the relationship between breakthrough pain characteristics and adjustment. As mentioned earlier, adjustment refers to the psychological processes that occur over time as the individual and those in their social world, manage, learn from and adapt to the multitude of changes which have been precipitated by the illness and its treatment (Brennan, 2001).

Measures of Adjustment

A number of multidimensional psychometric measures of adjustment have been developed (See Chapter 1). Unfortunately, none were suitable for the current study. Firstly, many of the instruments were of a length that would impose an unacceptable burden on patients with advanced disease. Secondly, many of the instruments contain items which are irrelevant for frail patients with a terminal illness. Thirdly, many studies that focus on a single dimension of adjustment focus on coping. Most research on coping uses instruments that measure aspects of the process of coping (e.g., ways of coping/coping strategies, coping styles, or acceptance) rather than the

outcome of these processes, that is, the level of coping. It is not possible to judge the outcomes of coping by studying the process, since there are marked individual and contextual differences in effective coping strategies. Coping measures too often include strategies that are not relevant, not within the patient's ability to use (e.g., distraction techniques involving physical activity, maintaining independence), or are maladaptive to most patients with advanced terminal illness (e.g., don't really believe have cancer, firmly believe getting better) (MAC scale, Watson, 1988). In other cases, research has focused on another single dimension of adjustment, acceptance. Unfortunately the outcome (acceptance) is very similar to one of the meanings of pain (a pragmatic response) discussed in later studies. Acceptance is therefore not a useful outcome measure in the present study. As a result of these shortcomings, none of the existing psychometric measures of overall adjustment or specific domains of adjustment were used.

Ideally, the measure of adjustment chosen for the present study would connect with the adjustment outcome variable in Study 1. The measure used in this study also needed to be relevant to patients with a terminal illness and brief enough to avoid imposing an unreasonable burden on frail patients. Study 1 utilised an archival database, in which the only available measure of adjustment (overall coping) was a single question with three possible responses. A similar single-item patient-reported measure of adjustment was adopted for the present study.

Several studies have used single-item measures of adjustment. For example, single-item measures have been used to rate perceived effectiveness of specific coping strategies (Jalowiec et al., 1984; Lindquist & Sjoden, 1998). A single-item measure of overall coping effectiveness has been used among students and older adults

(Aldwin, 1991), patients with psychological conditions (Aldwin & Reverson, 1987) women with gastrointestinal disorders (Drossman et al., 2000) and the carers of palliative care patients (Fisher, 2008). These measures used numerical rating scales. However, verbal rating, numerical rating and visual analogue scales have been found to be equally suitable for use among patients with acute and chronic pain (Cook, Elsharydah, Zavisca, & Alexander, 2004; Holgate, Asher & Thompson, 2003). Moreover, verbal analogue scale are widely used and considered more suitable than visual analogue scales for use with elderly people and clinical populations (Briggs & Closs, 1999). Therefore, a verbal analogue scale was adopted for use in the present study.

In this thesis, assessment of adjustment to pain focused on the patients' perception of their overall coping with pain regardless of whether they used cognitive, behavioural, emotional and/or social coping strategies. This construct has been termed level of coping with pain.

Factors That Influence Adjustment

A range of factors have been found to influence a person's ability to adapt to cancer pain (Chapter 1). The present study addresses two predictors of adjustment, breakthrough pain characteristics and psychological factors.

Breakthrough Pain Characteristics

Despite recent advances in pain medication and pain management practices, breakthrough pain characteristics (frequency, duration and intensity) continue to be a challenge for both patients and health professionals. The characteristics of

breakthrough pain are unpredictable and variable. For example, it lasts on average for 30 minutes (Portenoy, Payne & Jacobsen, 1999; Zeppetella et al., 2000; Zeppetella, 2008), occurs on average, four to seven times per day (Zeppetella, 2008) and ranges from mild to excruciating (Bhatnagar et al., 2010; Davies, Vriens, Kennett & McTaggart, 2008; Portenoy & Hagen, 1990; Zeppetella, 2008). However, episodes of breakthrough pain may be as brief as one minute or last more than 30 minutes (Portenoy, Payne & Jacobsen, 1999; Zeppetella et al., 2000). In addition, it may only occur once per day or it may occur several times (Zeppetella, 2008). The intensity is equally variable. This variability and unpredictability presents two challenges. First, patients do not know how long the episode will last or whether it is going to recur several times during the day. If it was known that a severe pain would be prolonged or recurring, strong analgesia may be warranted. On the other hand, if it was an isolated or mild to moderate episode, the patient may prefer to adopt alternative pain management strategies. Second, the average time for meaningful pain relief is 31 minutes (Zeppetella 2008), therefore the episode may be over before strong medication takes effect. Moreover, some patients may be reluctant to take medication because they fear addiction, or experience unpleasant side effects of medication (e.g., reduced alertness, constipation, nausea). In addition, patients in some countries may not have access to opiate medication. Consequently, patients must develop a range of strategies to assist them to adjust to breakthrough pain.

Research has consistently found that pain affects adjustment (e.g., Bennett et al., 2005; Ferrell, 2000; Fine et al., 2008; Jenson et al., 1991; Lin, 1998; Schwartzman et al., 1994; Turk et al., 1998; Williams & Keefe, 1991). This was also confirmed in Study 1. Although it is generally accepted that the experience of breakthrough pain

reduces quality of life, very few studies specifically address the influence of breakthrough pain on coping. Instead, the focus of most research on breakthrough pain is upon either the prevalence and incidence of breakthrough pain or the efficacy of various pharmacological treatments for reducing the intensity of breakthrough pain. However, there are exceptions. Breakthrough pain intensity and duration has been shown to be important in adjustment to breakthrough pain (Portenoy, Payne & Jacobsen, 1999; Zeppetella, O'Doherty & Collins, 2000). It is unclear whether the frequency of breakthrough pain is equally important to coping, since this has not been compared. This information is potentially important for designing interventions to improve adjustment to pain. Therefore, Study 2 extended previous research by exploring the influence of three breakthrough pain characteristics (frequency, duration and intensity) on one aspect of adjustment (level of coping) in a single study.

Psychological Variables

A number of psychological factors also influence adjustment. In Study 1, negative and positive emotions had a strong and consistent association with coping, but a less consistent association with quality of life. It was therefore concluded that relationships involving psychological factors may differ for different aspects of adjustment.

Previous research suggests that an additional two psychological factors warrant further investigation. The first, meaning of pain, has been extensively studied among non-cancer patients and in patients with early stage cancer. In these populations, it shows strong associations with use of coping strategies (e.g., Barkwell, 1991; Park et Page, S.M. (2011). The Influence of Psychological Factors on Adjustment to Pain in Cancer Patients Receiving Palliative Care

al., 2008), quality of life (Chung, 2000) and adaptation to illness (Fife, 2005). The second, patients' perception of the effectiveness of their range of pain management strategies, has been included because, on logical grounds, it can be predicted that if patients perceived their pain management strategies as ineffective, this is likely to have an adverse impact upon their adjustment. Unfortunately, existing studies have exclusively focused on clinicians' perceptions of the efficacy of various pain management strategies (e.g., Davies et al., 2009; Huang, Good & Zausniewski, 2010; Kutner et al., 2008; Mitera et al., 2010; von Gunten et al., 2010; Yennurajalingham, et al., 2010; Zerzan et al., 2010). The present study extends previous research by addressing this shortcoming by exploring the influence of two other psychological factors (meaning of pain and perceived effectiveness of pain management strategies) on one aspect of adjustment (level of coping) in a population of patients with advanced cancer who experience a particularly challenging form of pain.

Meaning of Cancer Pain

Most of the previous research indicates that the meaning making process, the meaning ascribed to cancer and the meaning ascribed to pain are important phenomena in pain perception and adjustment (Ahles, Blanchard & Ruckdeschel, 1983; Barkwell, 1991; Cassell, 1982; Chung, Wong & Yang, 2000; Ferrell & Dean, 1995; Fife, 1995, 2000; Lee, 2008; Northouse, 1988; Richer & Ezer, 2000; Spiegel & Bloom, 1993). Typically, positive or non-aversive meanings of cancer (Chung, 2000; Park et al., 2008) and cancer pain (Barkwell, 1991; Ferrell & Dean, 1995) are related to better adjustment to pain, and aversive meanings are related to poorer adjustment (e.g., Barkwell, 1991; Smith, Gracely & Safer, 1998). However, in a small number of

studies, no relationship has been found between meaning of cancer and adjustment (Dirksen, 1995; Gotay, 1985). There are three possible explanations for differences in findings about the relationship between meaning and adjustment. First, some of these studies explored meaning of cancer (e.g., Chung, 2000; Dirksen, 1995; Gotay, 1995) and others meaning of cancer pain (e.g., Barkwell, 1991; Smith et al., 1998). The meanings ascribed to cancer may not be the same as meanings ascribed to cancer pain. Second, meaning has been conceptualised and operationalised in different ways by researchers. This makes it difficult to determine whether they were measuring the same construct. In this thesis, meaning of pain has been defined as the patients' understanding of the sense they make of their pain, that is, the personal significance of the pain. Third, although there is a general acceptance that the meaning ascribed to pain is important to adjustment in other populations, relatively little research has been conducted about this relationship among cancer patients. However, only one study (Barkwell, 1991) was conducted exclusively among patients with advanced cancer. The meanings ascribed to pain, and also the relationships between meaning of pain and adjustment, may be different when the patient may recover, than when the illness is terminal. The present study extends previous research on the influence of meaning of pain, on adjustment by examining it in the context of breakthrough pain characteristics and terminal illness.

Measuring meanings of illness. There are very few measures of the meaning ascribed to pain among cancer patients. Because many researchers who have measured meaning of cancer pain have adopted or modified measures of meaning of illness, measures of meaning of illness are discussed. Several different approaches to the measure of meaning of illness have been adopted. For example,

Page, S.M. (2011). The Influence of Psychological Factors on Adjustment to Pain in Cancer Patients Receiving Palliative Care

Browne et al. (1988) used a cognitive approach in developing the 33-item Meaning of Illness Questionnaire (MIQ) for people with chronic illness. Findings showed that chronically ill patients tended to view their illness as a threat, a loss or a harm.

Brown et al., (1988) argued that individual differences in the extent to which patients adopted these three meanings of illness influences their adjustment.

Other researchers have developed measures of meaning based on a symbolic interactionist approach. Symbolic interactionism, a term coined by Blumer (1969) is based on three premises: people act on the basis of the meaning events have for them, meaning arises out of social interaction and these meanings are handled in and modified through an interpretative process which people use in dealing with the events they encounter. Thus, the meaning of illness is developed within the context of individual experience. Two methods of assessment of meaning of illness have been based on a symbolic interactionist approach. The *Constructed Meaning Scale* (Fife, 1995) was specifically designed for use with people with a life-threatening illness. Findings using this measure show that positive meanings of illness were associated with positive emotions and that adjustment was strongly associated with meaning.

The second method was based on qualitative research among patients with a range of diseases. Meanings ascribed to illness by these patients were categorised into eight general themes: challenge, enemy, punishment, weakness, relief, strategy, irreparable loss and value (Lipowski, 1970) (Table 3.1). Lipowski believed that coping strategies were directly related to the meaning patients ascribed to illness, and their attitude towards the illness. Although Lipowski's research occurred prior to the development

of the theory of stress and coping (Lazarus & Folkman, 1984) it is evident that meaning developed in the context of personal experience is common to both perspectives. Lipowski's meaning of illness categories are the basis for several measures of meaning of cancer pain (e.g., Barkwell, 1991; Caress, Luker & Owens, 2008; Ferrell & Dean, 1995).

Table 3.1

Lipowski's (1970) Categories for Meaning of Illness

Challenge	Disability or disease is perceived to be similar to other life situations that impose demands and tasks that need to be mastered by the available means.
Enemy	Disability or disease is perceived as an invasion by external or internal hostile forces. A need to fight or a feeling of helplessness and surrender may prevail.
Punishment	Disease or disability is perceived as a punishment that is either just or unjust. It may/may not be regarded as allowing for atonement.
Weakness shame	Disability or disease is perceived as a failing, or a sign of loss of control with negative moral implications. Feelings of may be involved.
Relief	Disability or disease is perceived as providing respite from demands and responsibilities of being well, or from a current interpersonal crisis or economic problem.
Strategy	Disability or disease is used as a technique to secure attention, support or compliance from others (related to Relief).
Irreparable Loss	Disability or disease is perceived the cause and/or source of overwhelming loss. For some people, even a minor loss of function may be given this meaning.
Value	The suffering involved in disability or disease is perceived as having some intrinsic value. For example, illness may be seen as promoting growth, or prompting a reconsideration of their priorities.

Measuring meanings of pain. Very few measures have been used specifically to study the meaning of cancer pain. Three of these are discussed. The first two were developed and used on patients in North America and the third in Taiwan. The simplest measure was a question which asked for a yes/no response concerning whether the patients perceived their pain as relating to disease progression (Smith et al., 1998). Findings using this measure showed that patients who perceive their pain to be an indication that the cancer had progressed report higher pain intensity and more negative affect. Second, Barkwell (1991) proposed a method of assessing the meaning patients ascribed to their pain using coding categories based upon Lipowski's (1970) meaning of illness categories (Table 3.2). Barkwell argued that Lipowski's meanings of illness were also relevant to meaning ascribed to cancer pain and included these meaning categories (coded from qualitative interviews) in analyses using Anova. The meanings most often ascribed to cancer pain were "challenge", "punishment" and "enemy." The meaning "challenge" was associated with higher coping and the meanings "punishment" and "enemy" were associated with poorer coping. Third, the *Perceived Meanings of Cancer Pain Inventory (PM CPI)* (Chen, 1995) was based upon Lazarus' Cognitive Theory of Emotions (Lazarus & Folkman, 1984) and qualitative interviews about spiritual concerns with cancer pain patients at a variety of stages in the trajectory of illness. Findings indicated four meanings (loss, challenge, threat and spiritual) were associated with differences in perceived pain intensity. The first two measures have explored relationships between meaning of cancer pain and aspects of adjustment among patients from two Western cultures, however these relationships were not explored among the Taiwanese patients using the PMCI (Chen, 1995).

The present study aims to examine the relationship between breakthrough pain characteristics, meaning of pain and adjustment in an Australian sample of patients receiving palliative care. Ideally, an instrument that specifically measures a range of meanings ascribed to pain and was validated for use among Western patients receiving palliative would have been available. None of the available measures meet these criteria. Although the PCMCA (Chen, 1995) is a validated quantitative measure of meaning of pain, almost half the cancer patients in the sample with whom it was developed were not terminally ill. In addition, the instrument was developed for an Asian population whose cultural beliefs and meaning-making may be markedly different from those in the Australian sample, which was predominantly of caucasian descent. In the absence of such a measure, it was preferable to use a custom-designed method of assessing meaning of pain rather than revert to a measure of meaning of illness, since meaning of illness is not the construct of interest and measures of meaning of illness were not designed for use with palliative cancer patients (e.g., Brown et al., 1988; Fife, 1995). This custom-designed measure was informed by the approach adopted by Lipowski (1970) and Barkwell (1991). However, it was adapted to allow use in a quantitative research design, by using a verbal analogue scale to rate how often the patient endorsed each of the meaning categories.

Relationships between meaning of pain and adjustment in palliative care.

A lot of evidence suggests that meaning-making and the meaning-made of illness influence the adjustment of patients who do not have advanced disease. There is widespread agreement that the meaning ascribed to illness is a significant predictor of adjustment to life-threatening illness (Antonovsky, 1980; Caress et al., 2008; Fife, Page, S.M. (2011). The Influence of Psychological Factors on Adjustment to Pain in Cancer Patients Receiving Palliative Care

1995; Haberman, 1987; Lewis, 1989; Marris, 1974; Northouse, 1988; O'Connor, Wicker & Germino, 1990). Indeed, many interventions which aim to promote positive adaptation after a diagnosis of cancer and cancer treatment focus on exploring illness-related beliefs and meanings (e.g., Richer & Ezer, 2000; Taylor, 1984; Taylor et. al. 1995). Similarly, there is widespread agreement that meaning is an important predictor of adjustment for patients who experience serious illness and pain (Ersek, 1994; Ersek & Ferrell, 1994; Haberman 1995; Lee, 2008; Roberts, Lepore & Hegelson, 2006; Steves & Kahn, 1987; Steeves, 1992). Most previous research has explored the relationship between meaning of pain (or meaning of illness) and adjustment among patients with a life threatening illness. However not all patients in the samples that produced these findings were in the terminal phase of their illness. Pooling patients at different points on the trajectories of illness has a number of disadvantages. Patients with the prospect of recovery from their disease are likely to adopt different meanings of pain and illness than patients with a terminal illness. Similarly, the relationship between the meanings ascribed to pain and adjustment may be different for patients with advanced disease and those who are newly diagnosed or receiving active treatment. The present study extended and clarified previous research findings by examining the relationship between meaning of pain and adjustment in a sample in which all patients were experiencing breakthrough pain, and receiving palliative care, using a quantitative research design and focusing on a Western sample.

Perceived Effectiveness of Pain Management Strategies

In addition to meaning of pain, the present study included a second psychological factor, perceived effectiveness of pain management strategies. Perceived

effectiveness of pain management strategies refers to the patient's subjective judgement about how helpful their range of strategies is for managing their breakthrough pain. Pain management strategies can include both pharmacological and non-pharmacological methods of managing pain. The latter include, but are not limited to, medication, acupuncture, cognitive behavioural therapy (CBT), relaxation, meditation, hypnosis, aromatherapy, therapeutic touch, distraction and imagery.

Many studies have examined the effectiveness of various pharmacological (e.g., Portenoy et al., 2006; Zeppetella & Ribeiro, 2006) and non-pharmacological pain management strategies (e.g., Anderson et al., 2006; Kwekkeboom, 1999; Zaza et al., 1999) in achieving pain relief. Most of these have been examined from the perspective of the clinician. In addition, pain management effectiveness ratings by health professionals were found to be associated with the preference of the professional discipline rather than the strategies per se (Zaza, 1999), few studies have examined effectiveness of pain management strategies from the patients' perspective.

The aim of the present study is not to examine the perceived effectiveness of specific pain management strategies in achieving pain relief or whether patients choose to use or have access to specific strategies. Instead, it examines whether the perceived effectiveness of whatever strategies patients use influences adjustment to breakthrough pain. Patients' perception of the effectiveness of their pain management strategies is significant because it indicates how well their breakthrough pain has been relieved. Ineffective pain relief is more likely to result in poor adjustment to pain (Bhatnagar, 2010; Brevik et al., 2009). In contrast, patients are more likely to report higher levels of adjustment when pain management strategies

are perceived to be effective. Ahles, Blanchard and Ruckdeschel (1983) and Lewis (1989) found that patients' pain management strategies and the meaning ascribed to the pain influenced the perception of pain and the ability to cope with pain. Although previous research has not examined this phenomenon in cancer patients from the perspective of the patient, effectiveness of pain management strategies is associated with pain intensity and symptoms of depression in patients with other chronic illnesses (e.g., Dawson et al., 2002; Hwang, Chang & Kasimis, 2002; Kemp, Ersek & Turner, 2005). The present study extended previous research findings by examining the relationship between the patient's perception of pain management effectiveness and another aspect of adjustment, level of coping, among patients with advanced cancer.

Potential Moderators of The Relationship Between Pain and Adjustment

So far, an argument has been presented that two psychological factors (meaning of pain and perceived effectiveness of pain management strategies) have direct associations with adjustment. However, it is possible that they also moderate the relationship between breakthrough pain characteristics and adjustment. In Study 1, patient emotion was found to have direct associations with adjustment and to moderate the relationship between pain characteristics and adjustment at the initial interview. The present study aimed to explore the possibility that meaning of pain and perceived effectiveness of pain management strategies show a similar pattern of relationships.

Meaning of pain.

The previous literature does not report studies which

examined the possibility that meaning of pain may moderate the relationship between

breakthrough pain characteristics and adjustment. Some practitioners have acknowledged that this may be the case, but they have not conducted studies that explore the potential interaction between adjustment, pain and meaning (e.g., Fine et al., 2008). Interrelationships between pain intensity, meaning of pain and use of coping strategies were reported in previous research (Barkwell, 1991). In this study, more effective adjustment in the presence of pain was reported by patients who ascribed the meaning “challenge” to pain. In contrast, poorer adjustment in the presence of pain was reported by patients who ascribed to the meanings “enemy” and “punishment”. Although moderation is implied, it was not tested. In addition, only relationships between meaning of pain, one pain characteristic (intensity) and two aspects of adjustment (use of coping strategies and symptoms of depression) were examined. Relationships between meaning of pain, other pain characteristics (e.g., frequency, duration) and use of coping strategies were not examined. It is also unclear whether the coping strategies used were perceived as effective by the patient. The present study proposed to extend previous research among patients with advanced cancer, by exploring relationships between breakthrough pain characteristics and level of coping. In addition, interaction terms for meaning of pain and three breakthrough pain characteristics (frequency, intensity and duration) would be included.

Perceived effectiveness of pain management strategies. Previous research has not examined the potential moderation of the relationship between breakthrough pain and adjustment by the perceived effectiveness of pain management strategies. However, negative intercorrelations were found between pain intensity, perceived effectiveness of pain management strategies and symptoms of depression among

patients with other chronic illnesses (Kemp, Ersek & Turner, 2005). This finding indicates a possible moderation of the relationship between one aspect of adjustment (symptoms of depression) and pain intensity by perceived pain management effectiveness. This potential interaction is plausible and worthy of exploration, because it may point to areas of focus for interventions designed to improve adjustment. The present study therefore proposes to examine these relationships among patients with advanced cancer.

Summary

This introduction presents a case for the examination of the relationships between breakthrough pain characteristics (frequency, duration and intensity) two psychological factors (meaning of pain and perceived effectiveness of pain management strategies) and adjustment (level of coping). The previous literature indicates that pain, and breakthrough pain characteristics and psychological factors are important to adjustment, but the influence of these two psychological factors on adjustment to breakthrough pain has not been explored in a sample of patients with advanced cancer. Previous studies have found that higher cancer pain intensity and frequency and longer pain duration were associated with poorer adjustment (e.g., Fine et al., 2008; Twycross, 1997). In addition, some meanings ascribed to pain are associated with better adjustment (Barkwell, 1991).

In Study 1, psychological factors not only had a direct relationship with adjustment, they also moderated the relationship between pain characteristics and adjustment.

Similarly, some meanings of pain are associated with lower use of coping strategies in the presence of high pain intensity (Barkwell, 1991). The present study proposes

to provide further insight into the relationships between breakthrough pain characteristics, meaning of pain and adjustment, using a custom-designed measure based upon the Lipowski (1970) and Barkwell (1991) approach. In addition, previous research has not examined these relationships specific to breakthrough pain. The present study proposes to address a gap in the literature by explicitly exploring whether meaning of pain moderates the relationship between breakthrough pain characteristics and adjustment by studying this using a quantitative design.

Previous studies have not examined the relationship between patients' perception of pain management effectiveness and adjustment to pain among cancer patients. However, these relationships have been found among patients with other chronic illnesses (Kemp, Ersek & Turner, 2005). The present study proposes to address the gap in previous research by exploring whether perceived effectiveness of pain management strategies moderates the relationship between breakthrough pain characteristics and adjustment among patients with advanced cancer.

Model To Be Tested

The previous findings and logical argument have been summarised into a model of the proposed relationship between three breakthrough pain characteristics (frequency, duration and intensity), psychological factors (meaning of pain, perception of pain management effectiveness), and adjustment (level of coping) (Figure 3.1). All breakthrough pain characteristics and one of the psychological factors (meaning ascribed to pain) are expected to show a direct relationship with level of coping. Further, meaning ascribed to pain is a potential moderator of the relationship between all breakthrough pain characteristics and level of coping.

Perceived effectiveness of pain management strategies is also a potential moderator of the relationship between pain characteristics and coping. Planned exploratory analyses will be conducted to investigate whether this is the case.

Research Hypotheses

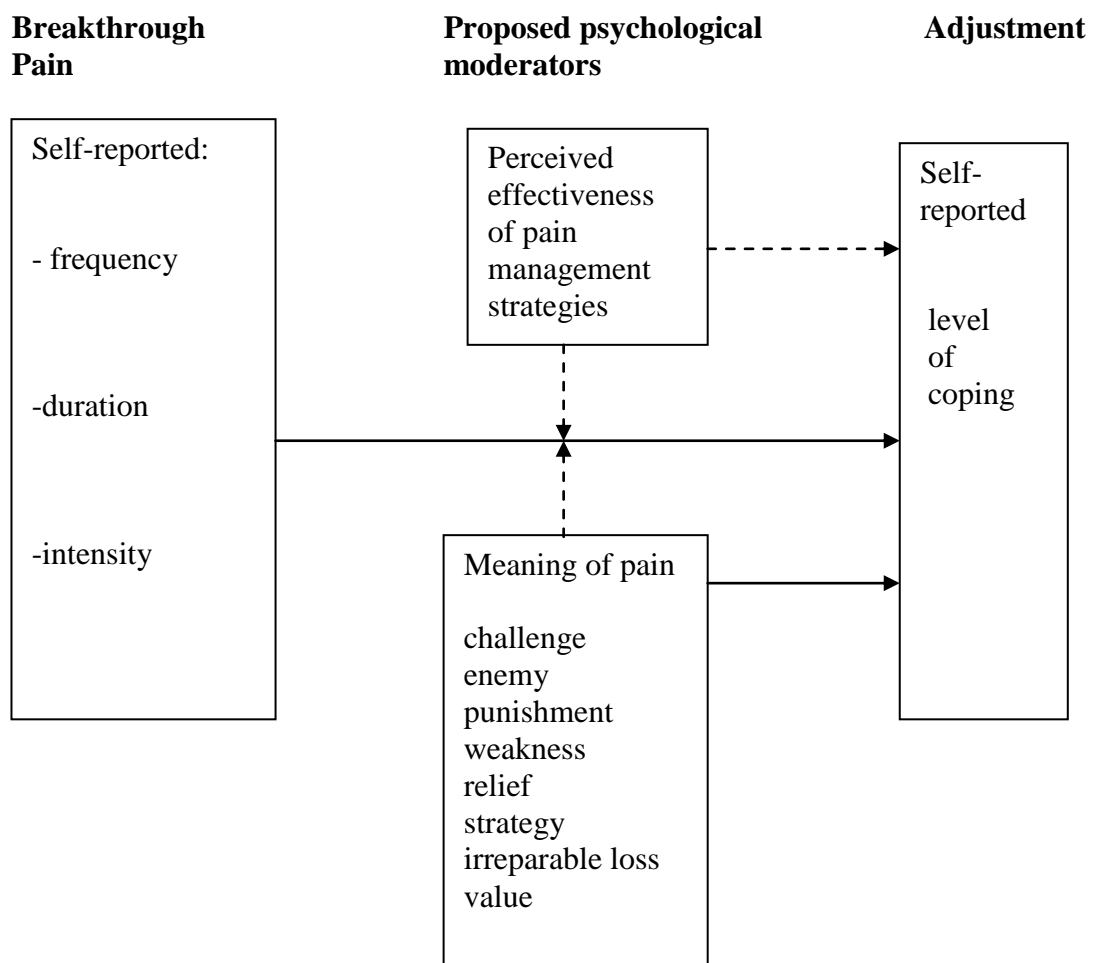
1. More extreme breakthrough pain (frequency, duration and intensity) will be associated with lower self-reported levels of coping.
2. The frequency of endorsement of one meaning of pain (challenge) will be associated with higher self-reported levels of coping with pain, while higher endorsement of two other meanings of pain (enemy and punishment) will be associated with lower self-reported levels of coping.

Exploratory Analysis

In addition, planned exploratory analyses concerning meaning of pain and pain management effectiveness were designed to answer the following research questions; for which there was insufficient prior research to support hypotheses.

1. Is self-reported level of coping associated with the frequency of endorsement of other meanings of pain, previously documented among patients with advanced cancer (weakness, relief, strategy, irreparable loss, value)?
2. Is perceived effectiveness of pain management strategies associated with self-reported level of coping?
3. Is the relationship between breakthrough pain characteristics (frequency, duration and intensity) and self-reported level of coping moderated by the meanings ascribed to pain?

4. Is the relationship between breakthrough pain (frequency, duration and intensity) and self-reported level of coping moderated by the patients' perception of effectiveness of their pain management strategies?



Legend.
 —————> Relationships tested in this study
 - - - - -> Possible relationships for which there were insufficient prior research to support a hypotheses.

Figure 3.1. The proposed relationship between breakthrough pain characteristics, pain management effectiveness, meaning of pain and level of coping.

METHOD

Participants

This chapter reports the quantitative component of the analyses. The details concerning the qualitative component are reported in Chapters 5 and 6. All participants were adults diagnosed with terminal cancer who were receiving community-based palliative care. There were six selection criteria for inclusion in the study. Patients needed to be at least 18 years of age, to have been diagnosed with incurable cancer, to have experienced at least one breakthrough pain during the past week, to speak fluent English, to have been judged by clinical staff as capable of completing an interview lasting 30 minutes and to have the cognitive capacity to provide informed consent. The most common reason for ineligibility was that the patient had not reported experiencing a breakthrough pain in the week preceding data collection.

I planned to recruit at least 210 participants for the study to provide sufficient power (.08) and a medium effect size ($f^2 = .15$) for the planned analyses. Southern Adelaide Palliative Care Service in South Australia was chosen as the recruitment site because it had a sufficiently large intake of patients to allow this sample size to be achieved. However, recruitment began slowly because several other studies were also recruiting from the same service. Then, an unfortunate modification to the study design became necessary when a new major study was funded and given priority to recruit from the same population. Although recruitment was conducted for the full 18 months available for the current study, only 20 patients were able to be recruited.

Although it was not possible to access the desired number of patients, 69% of eligible patients agreed to participate. However, 26% of the patients who agreed to participate, were unable to do so due to physical decline or death before data collection (see Figure 3.2). Because of the advanced and unpredictable trajectory of illness, just over 50% of 39 eligible patients were able to complete the study. The demographic characteristics of the sample were representative of palliative care patients attending the service. Patients were mainly middle-aged or elderly ($M = 64.35$ years, $SD = 11.13$). The sample was balanced for gender (Females = 55%). All patients were of caucasian descent and were residents of Australia. The majority (70%) of patients reported that they used pain medication. Patients had a wide variety of solid tumours (Table 3.2). The most commonly reported tumours were

lung, colorectal and bone cancers.

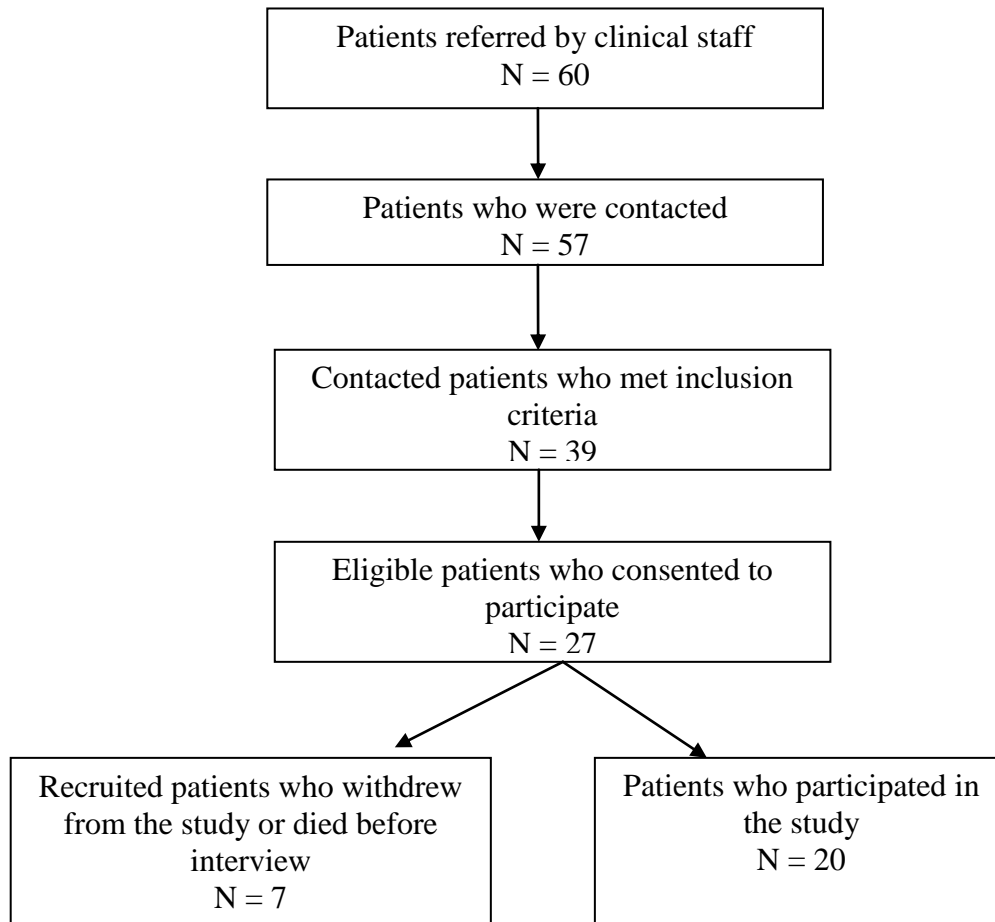


Figure 3.2. Flowchart showing derivation of the sample.

Table 3.2

Primary Diagnosis of Participants (N = 20)

Primary site of neoplasm	n	%
Lung	4	20.0
Colorectal	4	20.0
Liver, Pancreas	2	10.0
Bone	3	15.0
Kidney	2	10.0
Other	5	25.0

Measures

Patients recruited for the study were very ill. The overriding concern in selecting measures was to minimise participant burden. This precluded the use of multi-item scales. Verbal rating scales were used since these are more suitable than visual analogue scales for use with elderly people and clinical populations (Briggs & Closs, 1999). All measures were administered in interview format by the author (Appendix D).

Predictor Variables

Breakthrough Pain

Three dimensions of pain were assessed using questions taken from longer pain assessment tools.

Breakthrough pain intensity. Patients responded to a single question, “On a typical 24-hour-day, how would you rate the intensity of your breakthrough pain or discomfort?” (*Brief Pain Inventory*, (Cleeland, 1991)) using a 5-point verbal rating scale (a=“mild discomfort,” b=“slightly painful,” c=“moderately painful,” d=“severe pain” and e=“excruciating”).

Breakthrough pain frequency. Patients’ answered an open ended question, “How often did you experience breakthrough pain during the past week?” (*Alberta Breakthrough Pain Assessment Tool for Cancer Patients*, Hagen et al., 2008).

Their answers were divided by 7 to yield the mean daily frequency of breakthrough pain.

Breakthrough pain duration. Duration of pain was assessed by an open ended question, “How long do/does these breakthrough pain(s) usually last?” (*Alberta Breakthrough Pain Assessment Tool for Cancer Patients*, Hagen et al., 2008).

Meaning of Pain

The meaning of pain was assessed by a custom-designed measure derived from qualitative studies that showed that most patients ascribed one of eight meanings to illness and pain (challenge, enemy, punishment, loss, weakness, value, strategy or relief) (Barkwell, 1991; Lipowski, 1970). After the provision of some context for the task, patients were asked to explain what pain meant to them, in their own words. (These narratives were coded for use in Studies 4 and 5). Patients were then asked to rate their endorsement of eight statements, “I view my pain as (a challenge, an enemy, a punishment, a loss, a weakness, having value, a relief, a strategy),” using a 5-point verbal analogue scale (never, rarely, sometimes, usually and always). There was thus a single item measure for each of eight meanings of pain.

Perceived Effectiveness of Pain Management Strategies

Patients were asked to rate the perceived overall effectiveness of their breakthrough pain management strategies by responding to the question: “How effective or helpful overall, do you think that your breakthrough pain management strategies are for you?” using a 5-point verbal analogue scale: (never helpful”, “rarely helpful”, “sometimes helpful”, “usually helpful” “always helpful”). This question is an adaptation of one question from the *Patient Opinion of Pain Management (POPM)* scale (Calvin, Becker, Biering & Grobe, 1999).

Outcome Variable

The present study included one measure of adjustment, level of coping, which was assessed on the same occasion as predictor variables.

Level of coping. In the present study, coping refers to the patients' perception of their level of adaptation achieved through their whole range of cognitive and behavioural efforts and emotional and social responses to cancer pain. As discussed previously, the common measures of coping concerned coping styles or ways of coping which is not the focus of the present research. Therefore a measure of level of coping was required. Two alternatives were considered. The first was to develop a single visual analogue rating scale. This has the advantages of minimising patient burden and directly measuring level of coping unconfounded with judgements about effectiveness of specific coping strategies. The second option was to develop a custom-designed multi-item scale. Both options were pilot tested by the researcher in a sample of 18 patients with advanced cancer drawn from the same population as the main study. However there were a number of problems with the multi-item measure. The patients had difficulty with many of the items. In addition, the measure had low internal consistency in this population (Cronbach alpha= .39) In contrast, the single-item was well accepted and understood by the patients. The single item approach has been widely used in previous research (Aldwin, 1991; Aldwin & Reverson, 1987; Drossman et al., 2000; Fisher, 2008) and was adopted for the present study.

The patient responded to the question, “ How well do you believe that you cope with the breakthrough pain you are experiencing” using a 5-point verbal analogue scale (not coping at all, barely coping, sometimes coping/sometimes not, moderately coping and coping very well). The scale was then converted to a numerical form (1= not coping at all to 5 = coping very well) for analysis.

Procedures

Clinical staff referred patients who consented to being contacted by researchers to the study. These patients were then contacted by the researcher to discuss the research and to determine whether those patients who agreed to participate met the inclusion criteria. Each patient was given an Information Sheet describing the study and Informed consent was obtained from each participant prior to the interview (See Appendices E and F). Patients' medical details were obtained from the medical records after patients consented to this information being released to the researcher. Patients completed the semi-structured interview in their own homes. The time to complete the interview varied according to the patients' responses and level of functioning on the day. In addition, the interview was often emotionally difficult for patients because some were close to death. Indeed, one patient died later in the day on which she completed the interview. In some cases, despite every effort to be brief, the interview took up to one hour because patients had a need to talk with someone who was not involved in their primary care, and there was an ethical obligation to attend to this need. (The author has training in clinical psychology and is currently practicing as a registered psychologist). This phenomenon has been reported in previous literature (e.g., Davy & Ellis, 2000).

Statistical Analysis

This study used a cross-sectional design because it was conducted in a population with high attrition that results from rapid deterioration in health or death of potential participants. The study should be considered to be exploratory. The sample was much smaller than intended and therefore major modifications needed to be made to the planned analyses. In particular, relationships between predictors and the outcome

could only be examined using simple bivariate correlations. This precluded two research questions being answered:

Exploratory analysis 3. Is the relationship between breakthrough pain (frequency, duration and intensity) and self-reported level of coping moderated by the meanings ascribed to pain?

Exploratory analysis 4. Is the relationship between breakthrough pain (frequency, duration and intensity) and self-reported level of coping moderated by the patients' perception of effectiveness of their pain management strategies?

However, the planned examination of the relationship between pain variables, meaning of pain, and level of coping could still be conducted (Hypotheses 1 and 2).

Results

Study 2 had three aims. The first was to describe the intensity, frequency and duration of breakthrough pain experienced by cancer patients receiving community-based palliative care in an Australian medical context. The second aim was to examine relationships between breakthrough pain characteristics and a measure of adjustment, level of coping. The third and main aim was to conduct a preliminary exploration of the relationship between meaning of pain, perceived effectiveness of pain management strategies and adjustment to pain. The results are presented in three sections: preliminary analyses conducted to ascertain the appropriateness of the data for the analyses, results of descriptive analyses addressing these aims and correlation

analyses pertaining to aims two and three. Due to the exploratory nature of the study and the low statistical power of the analyses, I will note effects that reach the criteria for statistical significance ($p \leq .05$) and non-significant trends that account for more than 10% of the variance.

Preliminary Analyses

The distribution of scores was examined for each of the predictor and criterion measures. Because none of the measures showed a normal distribution, Spearman correlations rather than Pearson correlations were used to examine Hypotheses 1 and 2 and to conduct exploratory analyses. This precluded the possibility of conducting partial correlations in order to explore whether the variance accounted for in adjustment was unique.

Descriptive Statistics

Breakthrough Pain characteristics. Although breakthrough pain intensity ranged from 1 (mild discomfort) to 5 (excruciating pain) (Median = 3.50), most patients reported breakthrough pains of problematic intensity. Half of the patients reported experiencing either a severe (35%) or an excruciating (15%) intensity of pain. Although the average frequency of breakthrough pain ranged between 0.14 and 9 per day (Median = 1.50 per day), it was generally low. Almost half of the sample experienced one or fewer breakthrough pains per day.

The duration of breakthrough pain was highly variable and the average duration of an episode of breakthrough pain ranged between 1 and 300 minutes (Median = 17.5 minutes). However, almost half the sample experienced relatively brief episodes of breakthrough pain (15 minutes or less).

Relationships between these breakthrough pain characteristics were examined.

This suggested that breakthrough pain represented a challenge to adjustment for many participants. Among the patients who reported severe to excruciating pain intensity (50%), breakthrough pains lasted between 3 and 90 minutes and occurred up to 9 times per day. Nevertheless, many participants reported breakthrough pain that was less frequent, shorter in duration and less intense than reported in previous studies (Bruera, 1997; Cleeland, Gonin, Baez, Loehr & Pandya, 1997; Coyle, Adelardt, Foley & Portenoy, 1990; Gomez-Batiste, van den Beuken, Van Everdingend, de Rijke, Kessels & Schouten, 2007; Zeppetella, 2008). Only 1/20 of the patients in this sample reported breakthrough pain that was intense, frequent and persistent (lasting more than 60 minutes). In addition, a relatively large number of patients (4/20) reported breakthrough pain that was of only moderate intensity and was brief (lasting between 1 and 6 minutes). Thus, although all the patients in the sample experienced breakthrough pain, the characteristics of their breakthrough pain were not ideal to answer the research questions. In particular, the restricted range of scores on two pain characteristics (frequency and duration) had several implications for the main statistical analyses.

Meaning variables. Patients ascribed both aversive and non-aversive

meanings to pain. In particular, most patients endorsed multiple meanings. Almost

half of the patients (8/20) endorsed two meanings. One patient did not endorse any of the meanings of pain that were assessed. The most frequently endorsed meaning categories were “enemy”, “loss” and “value.” Few patients endorsed the other five meaning categories (Table 3.3). This needs to be considered when interpreting the results of the main analyses.

Table 3.3

Meaning Ascribed to Pain (n = 20)

<u>Meaning</u>	<u>n</u>	<u>Endorsement %</u>
Challenge	5	35.0
Enemy	12	60.0
Punishment	3	15.0
Loss	12	60.0
Weakness	4	20.0
Value	10	50.0
Strategy	4	20.0
Relief	4	20.0
None	1	5.0

Perceived effectiveness of pain management strategies. Most patients reported their repertoire of pain management strategies to be effective. All but one patient reported that their pain management strategies were at least sometimes helpful. Most of the sample (60%) endorsed one of the two highest ratings of pain management effectiveness. The resulting lack of cases at the lower end of the distribution reduced the possibility of identifying relationships using correlations.

Level of coping. Most patients reported that they were coping rather

well. No patients endorsed either the “not coping” or “barely coping” response

options. About 2/3 of the patients reported that they were either coping moderately well (25%) or very well (35%) (i.e., endorsed the top two ratings). Thus, as with most of the predictor variables, the range of scores for coping was restricted.

Intercorrelations Between Predictors

Correlations between the predictors were examined to determine whether breakthrough pain characteristics, meaning of pain and perceived effectiveness of pain management strategies were related. Any relationships between predictors needed to be identified because those have implications for interpretations of the main analyses.

Relationships between Breakthrough Pain Characteristics

Examination of Spearman correlations between the pain variables (intensity, frequency and duration) indicated that these were not related (all $\rho < .17$, all $p > .10$) and therefore it is possible to be confident that any relationships found between a pain variable and levels of coping are unique.

Relationships between Meaning Variables

Examination of Spearman correlations between the meaning categories revealed inter-correlations between the non-aversive meaning categories (Table 3.4). There was a strong positive correlation between the meaning categories: “strategy” and “relief”. A correlation of this magnitude is consistent with the findings of Barkwell (1991) and suggests that the quantitative nature of the measurement in the current study did not change patterns of relationships. There were also moderate positive correlations between “value” and two other meaning categories “challenge” and “strategy.” In addition, there was a trend towards a positive association between the

meaning category “weakness” and two other categories “strategy” and “relief.” (Table 3.4). If the main analyses show any relationships between the measure of adjustment (level of coping) and these intercorrelated predictor variables, it will not be possible to identify unique sources of variance or moderation in the absence of regression analysis.

Table 3.4

Intercorrelations Between Meaning Variables (N = 20)

	Enemy	Punishment	Loss	Weakness	Value	Strategy	Relief
Challenge	.01	-.02	.17	.04	.58**	.28	.31
Enemy	--	.12	-.10	.23	-.01	.14	.03
Punishment		--	.17	-.21	.08	.12	-.21
Loss			--	-.21	.25	.23	.14
Weakness				--	-.06	.36	.35
Value					--	.57**	.42
Strategy						--	.73**
Relief							--

* $p \leq .05$.

** $p \leq .001$.

Relationship between Breakthrough Pain Characteristics and Meaning Variables

Only two of the eight meaning categories appeared to be related to any of the breakthrough pain variables (Table 3.5). There were moderate to strong positive correlations between breakthrough pain frequency and the degree to which the patient viewed pain as having two negative meanings: “enemy” and “weakness”.

There was also a non-significant trend towards a negative association between breakthrough pain duration and the degree to which the patient view pain as having the meaning “weakness. This explained more than 10% of the variance (Table 3.5).

Unfortunately, it was not possible to determine whether these associations account for unique variance because they were also correlated with other predictors.

Relationship between Breakthrough Pain Characteristics and Perceived Effectiveness of Pain Management Strategies

Only one of the breakthrough pain characteristics, frequency significantly correlated with perceived effectiveness of pain management strategies (Table 3.5). There was a moderate to strong negative correlation between breakthrough pain frequency and perceived effectiveness of pain management strategies. There was also a non-significant trend towards a positive association between breakthrough pain duration and perceived effectiveness of pain management strategies. This accounted for more than 10% of the variance (Table 3.5). It was not possible to determine if these breakthrough pain variables accounted for unique variance in pain management effectiveness. Moreover, in the absence of multiple regression analysis, it will not be possible to determine which of these intercorrelated variables make unique contributions to coping in the main analyses.

Relationship between Pain Management Effectiveness and Meaning Variables

Only one of the eight meaning categories was significantly related to perceived effectiveness of pain management strategies (Table 3.5). A moderate negative correlation was found between the extent to which patients viewed their pain as a “weakness” and their perception of the effectiveness of their pain management strategies. There was also a non-significant trend towards a negative association between the perceived effectiveness of pain management strategies and the extent to

which the patient viewed their pain as an “enemy.” This accounted for approximately 10% of the variance (Table 3.5). Whether these are sources of unique variance in pain management effectiveness cannot be determined.

Main Analyses

Analyses relating to two hypotheses and two planned exploratory analyses could still be conducted, using Spearman correlations.

Relationship between Breakthrough Pain Characteristics and Level of Coping.

Hypothesis 1 predicted that all three breakthrough pain characteristics (intensity, frequency and duration) would be negatively associated with self-reported levels of coping. However, this was only true for breakthrough pain frequency. A moderate to strong negative correlation was found between breakthrough pain frequency and level of coping (Table 3.5). A non-significant trend towards a negative association was also found between breakthrough pain intensity and level of coping. This accounted for 10% of the variance (Table 3.5). Although a relationship between breakthrough pain duration and level of coping was not observed in these analyses, it is worthy of further exploration in future research. Thus, Hypothesis 1 was only partially supported.

Relationship between Breakthrough Pain Characteristics, Meaning Variables and Level of Coping

Hypothesis 2 predicted that endorsement of one positive meaning of pain, “challenge,” would be associated with higher level of coping, but that endorsement of two negative meanings of pain, “enemy and punishment” would be associated

with lower levels of coping. The analyses also explored whether other meanings of pain were associated with level of coping with pain. Only one meaning category was correlated with level of coping with breakthrough pain and this was not one of the meanings about which predictions had been made. A moderate to strong negative correlation was found between the extent to which patients perceived their pain to be a weakness and level of coping (Table 3.5). There was also a non-significant trend towards a negative association between the extent to which patients viewed their pain as a “strategy” and level of coping. This accounted for more than 10% of the variance (Table 3.5). Thus, these results are not consistent with previous research (Barkwell, 1991). More than just the meanings “challenge”, “enemy” and “punishment” are worthy of examination.

Relationship between Pain Management Effectiveness and Level of Coping.

The planned exploratory analysis showed that there was a moderate positive correlation between perceived effectiveness of pain management strategies and level of coping with pain (Table 3.5).

Table 3.5
Intercorrelations Between Predictors and Level of Coping (n = 20)

	Breakthrough Pain		Meaning		PME	Coping
	Duration	Frequency	Weakness	Enemy		
Breakthrough Pain	.02	.14	-.09	-.12	-.17	-.32
Intensity						
Duration	--	-.16	.38	-.05	-.37	.12
Frequency		--	.54*	.47*	-.56*	-.57**
Meaning=						
Weakness			--	.04	-.45*	-.55*

Enemy	--	-.33	
PME		--	.47*
Coping			--

* $p \leq .05$. ** $p \leq .001$.

PME = Perceived effectiveness of pain management strategies.

Conclusions

Despite the small sample size, the unusual frequency and duration of breakthrough pain in this sample, and restricted range of responses on predictor variables, relationships were found between some predictors and level of coping. Self-reported level of coping was negatively associated with pain frequency and endorsement of the meaning of pain as a “weakness”, and positively associated with perceived effectiveness of pain management strategies. However, these predictors of coping were inter-related. There was a relationship between the endorsement of two meanings of pain “weakness” and higher pain frequency and lower perceived effectiveness of pain management strategies. In addition, there was a negative relationship between endorsement of the meaning of pain as “weakness” and perceived effectiveness of pain management strategies. Therefore, it is not possible to determine whether these predictors account for unique variance in level of coping under the constraints of the current analyses. With this caveat, the relationships between variables are summarised in Figure 3.3.

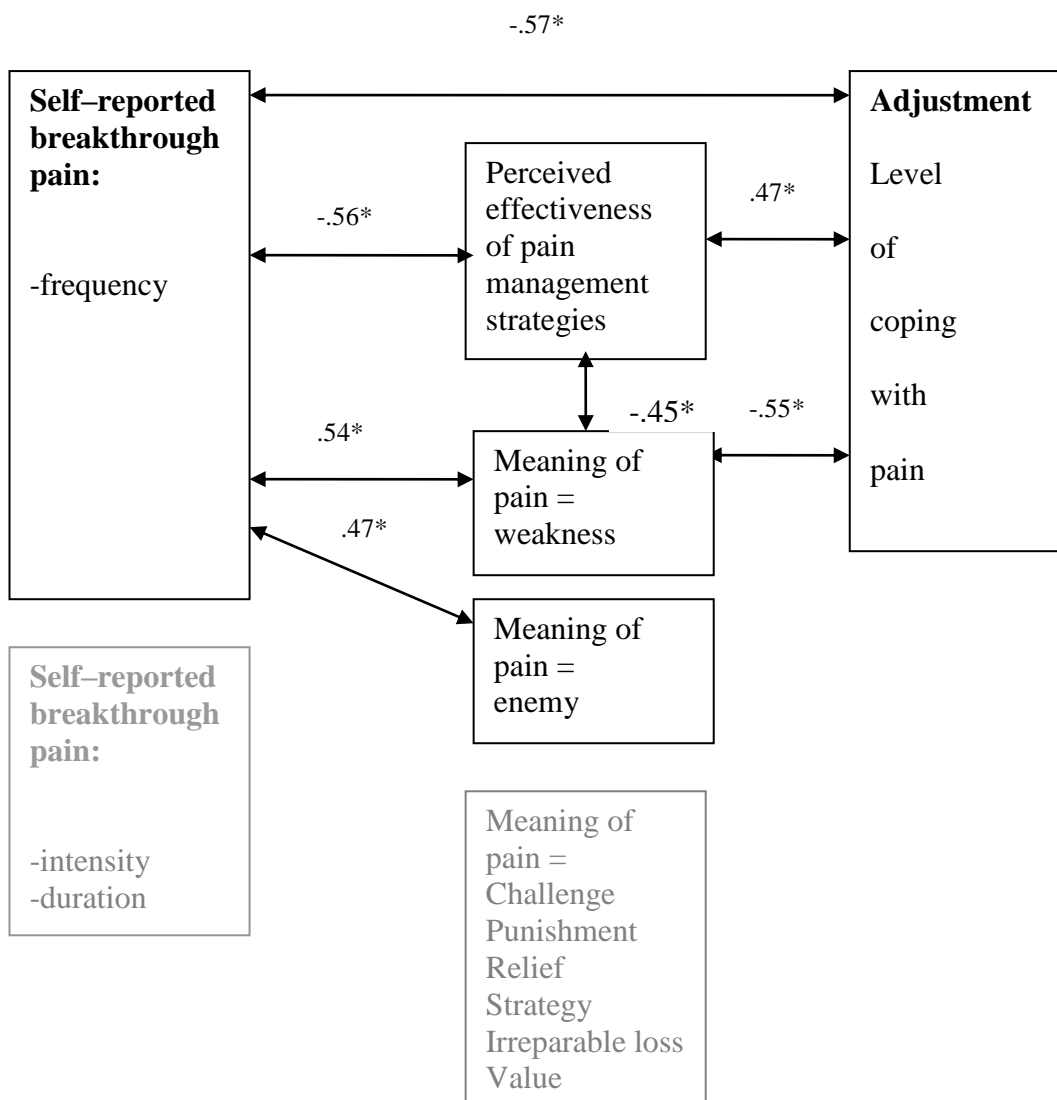


Figure 3.3. Relationships found between pain characteristics, meaning of pain, pain management effectiveness and adjustment. (Significant relationships in black. Grey denotes variables for which significant relationships were not found).

Discussion

The main purpose of the present study was to explore the influence of two psychological factors (meaning of pain and perceived effectiveness of pain management strategies) on the relationship between breakthrough pain characteristics and adjustment. It also aimed to describe breakthrough pain experienced by Australian cancer patients receiving community-based palliative care and to explore the relationships between breakthrough pain and level of coping. However, I was unable to conduct the analyses as originally planned due to events outside of my control that prematurely ended recruitment. The study was therefore only able to provide preliminary analyses of the relationships between meaning of pain, perceived effectiveness of pain management strategies and level of coping.

Only Hypotheses 1 and 2 and research questions 1 and 2 were able to be explored in a sample of this size. However, this exploration was further compromised by the distribution of data. Although many patients experienced intense pain, episodes of breakthrough pain were unusually brief and infrequent (e.g., Portenoy et al., 1999; Zeppetella et al., 2000; Zeppetella, 2008). This is likely to have an influence on the pattern of results because more frequent breakthrough pain was associated with poorer adjustment. Given this, it was not surprising that the current results reveal both consistencies and inconsistencies with existing literature. For example, the present study extended previous research by finding that more frequent breakthrough pain was associated with poorer coping. In addition, the non-significant trend for more intense breakthrough pain to also be associated with poorer adjustment is

consistent with previous findings (e.g., Fine et al., 2008; Portenoy et al., 1999).

However, there was no evidence that duration of breakthrough pain was associated with adjustment, despite this relationships being reported previously (Portenoy et al., 1999; Rustoen et al., 2005). Failure to find all the expected relationships between all breakthrough pain characteristics and adjustment may be due to the very small number of patients in the sample who were not coping well, and who were experiencing frequent and long-lasting episodes of breakthrough pain.

Several results relating to meaning of pain were also unexpected. Patients in this sample subscribed to more than one meaning of pain and only one meaning category of meaning of pain was associated with adjustment. The meaning of pain as “weakness” was associated with poorer coping, even though only a small number of patients subscribed to this meaning. Although associations between the meaning patients ascribe to pain and their adjustment have been found in previous research (Barkwell, 1991; Chung, 2000; Ferrell & Dean, 1995; Lee, 2008; Lipowski, 1970; Park et al., 2008), none have reported the specific association found in the present study. It is also noteworthy that the results did not replicate findings previously reported in a sample of patients with advanced cancer, showing that three meanings (challenge, enemy and punishment) were associated with coping (Barkwell, 1991). It is not possible to identify the reasons for this difference. It may be that the meanings that the patients in this sample ascribe to their pain are not captured by these eight themes, or by the quantitative measure. Chung (2000) reported that meanings ascribed to pain could not easily be categorised. It is also possible that there was too little variability in coping in the current sample. Further research is required in order to explain this inconsistency.

An innovation in the current study was to examine whether another psychological variable, perceived effectiveness of pain management strategies was also associated with coping. Overall, perceived effectiveness of pain management strategies was moderately associated with higher levels of coping. This finding extends previous research that investigated the efficacy of pain medications (e.g., Davies et al., 2009; Portenoy et al., 2006; Zeppetella & Ribeiro, 2006; Zeppetella, 2008), health professionals' perceptions of the effectiveness of non-pharmacological strategies (e.g., Anderson et al., 2006; Cepeda et al., Huang et al., 2010; Kwekkeboom, 1999; Kutner et al., 2008; Robb et al., 2009; Searle et al., 2009; Zaza et. al., 1999) and patient satisfaction with pain management (e.g., Bhatnagar, 2010; Dawson et al., 2002; Hwang, Chang, & Kasimis, 2002, Tang, Liu, Lin, & Chen, 2010). No previous research has examined the relationship between patients' perceptions of the effectiveness of pain management strategies and their adjustment to pain, among patients with advanced disease. One shortcoming of the present study is the small number of patients who reported that the effectiveness of pain management strategies was poor. Further research is needed with a larger sample with more diverse pain management effectiveness before firm conclusions about the relationship between perceived effectiveness of pain management strategies can be drawn.

The present study had four limitations. First, the sample generally consisted of patients who were coping reasonably well, who perceived their pain management strategies to be effective and were experiencing few episodes of breakthrough pain. Therefore, the sample was not ideal for answering the research questions, because

the restricted range of responses reduced the possibility of finding relationships between the predictors and adjustment. Second, there were significant inter-correlations between the three predictors that were found to be related to adjustment: the meaning category “weakness,” pain frequency and perceived effectiveness of pain management strategies. In the absence of the possibility of conducting regression analyses or partial correlations, these inter-correlations made it impossible to determine whether these predictors make unique contributions to the variance in level of coping. Third, the present study explored relationships between the frequency with which patients ascribed these meanings to breakthrough pain, and level of coping. However, the effectiveness of these meanings may be equally important to level of coping, and yet it was not explored. Fourth, there was only one outcome measure and this was a single-item custom designed measure with face validity, but no demonstrated concurrent or discriminant validity in the current population and the analyses had low power because the sample size was small. In addition, non parametric correlations had to be used because of the non-normal distribution of scores. However, moderate (greater than 0.4) effect sizes were detected between pain frequency, perceived effectiveness of pain management strategies and two of the meaning variables (weakness and enemy). Moreover, relationships were found between one breakthrough pain characteristic (frequency), two psychological factors (meaning of pain as a weakness and perceived effectiveness of pain management strategies) and level of coping. This suggests that the propositions under examination in the current study are worthy of future research in a larger sample.

Despite its limitations the study was able to draw two conclusions to guide future research. First, the meaning patients in the current sample ascribed to their pain did not appear to have been adequately captured by the meaning categories derived from previous research. There were two problems. Only four of the meaning categories were endorsed by more than one third of the sample. Although challenge and enemy were among these, they did not show the associations with coping that were indicated in the literature (Barkwell, 1991; Lipowski, 1970). The only meaning category (weakness) that was related to adjustment was endorsed by only one fifth of the sample. The second problem was that half of the patients endorsed multiple meanings of pain. A different measure of meaning of pain may help to ascertain the meanings of pain that are relevant to this population and to explore the phenomenon of multiple meanings.

Second, research designs and methods of analysis need to be able to accommodate variables that are inter-correlated. This is particularly the case when both breakthrough pain characteristics and pain management effectiveness are included in the analysis. For example, lower breakthrough pain frequency was associated with higher perceived effectiveness of pain management strategies. This finding is to be expected. Such inter-correlations are consistent with the possibility that variables may mediate the effect of others. Explaining the possibility of moderated relationships was one of the aims of this study that could not be fulfilled due to the small sample size. It is worthy of examination in a larger sample.

The present study has contributed to existing knowledge by reporting breakthrough pain characteristics (frequency, intensity and duration) in a modern Australian

sample receiving community-based palliative care. No previous research has reported these characteristics. It also extended understanding of the predictors of coping in patients with advanced disease. The results indicate that relationships between breakthrough pain characteristics, meaning ascribed to pain, perceived effectiveness of pain management strategies and adjustment exist. However, the insufficient sample size and restricted range of scores across most variables made it impossible to draw strong conclusions. Therefore, I planned to further explore these relationships in a larger sample. Two improvements in measures were warranted. Therefore, a larger range of response alternatives will be included in the measures of predictors and the outcome in an attempt to improve the spread of scores. In addition, because the meaning of pain measure used in the present study may not have adequately captured the meanings patients ascribed to their pain, it will be replaced by a different quantitative measure of meaning of pain.