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## Preoperative predictors of postoperative pain

Robyn A. Paterson  
*Edith Cowan University*

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**PREOPERATIVE PREDICTORS OF POSTOPERATIVE PAIN**

**BY**

**Robyn A. Paterson R.N., B. Applied Science (Multidisciplinary)**

**A Thesis Submitted in Partial Fulfilment of the Requirements for the Award of**

**Master of Nursing**

**at**

**School of Nursing  
Edith Cowan University**

June 1993



## USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

## **ABSTRACT**

### **PREOPERATIVE PREDICTORS OF POSTOPERATIVE PAIN**

The purpose of this study was to investigate five factors, which have been identified in the literature as having influence on the experience of postoperative pain. (1) Patient satisfaction with preoperative information, (2) Anticipated postoperative pain, (3) General self-efficacy, (4) Age, (5) Gender. These variables were examined to determine their relationship, if any with postoperative pain. Any relationship between these variables was also examined.

Review of the literature revealed considerable research on pain, and that much of that research has been directed at the treatment of, rather than prediction of postoperative pain. Also, these studies have focused on patients who are receiving analgesia via traditional methods. No work has been reported on preoperative estimation of postoperative pain on those patients using Patient Controlled Analgesia as a single method of pain control. For this reason the study group consisted of patients who have undergone abdominal surgery, and have used the Patient Controlled Method of postoperative pain control.

One independent variable, self-efficacy, was shown to be significantly correlated to postoperative pain scores and to contribute to the preoperative prediction of how much postoperative pain an individual may experience. Weak but significant correlations were also noted between satisfaction with preoperative information, age and expectation of postoperative pain. The results also demonstrated a significant lack of specific preoperative information of pain and pain control methods amongst the subjects. There were large inconsistencies noted between how much pain subjects experienced and how much pain they had expected to experience.

The results are of particular importance to nurses as they affect the nature of preoperative teaching, patient assessment and the provision of effective postoperative pain control, all of which are significant nursing responsibilities.

## **DECLARATION**

**I certify that This thesis does not incorporate, without acknowledgment, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text.**

**Robyn Anne Paterson**

## **ACKNOWLEDGEMENTS**

- **My supervisor during the preparation of this thesis Mr Gerry Farrell for his help and encouragement.**
- **My family and colleagues, without who's support this study would not have been possible.**

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# **CHAPTER 1**

## **INTRODUCTION**

The management of postoperative pain is a significant problem for both patients and health workers and one which has the potential to have far reaching social, personal and financial consequences. Because many of the patients with which nurses have contact suffer from acute or chronic pain its management is central to many nursing situations.

Research in the area is quite considerable and this volume of previous work reflects the perceived importance given to pain management by health professionals. The majority of research into acute postoperative pain however, is directed at examining measures used to relieve existing pain rather than identifying preoperative factors which may influence or predict the patient's response to postoperative pain.

Despite recent advances in pharmacological and non-pharmacological management of pain, studies have shown that the proportion of patients who suffer moderate or intense postoperative pain may be as high as 80% (Carr, 1990; Ketovuori, 1987; Rees & Davis, 1993). One technique which has shown to have the potential to address, at least in part, the problem of high pain levels is that of Patient Controlled Analgesia (PCA). This method of pain control is used for both chronic and acute pain in medical and surgical settings. Its use allows the patient to self administer analgesic

drugs within set guide-lines, usually under medical or nursing supervision, and is claimed to be an effective technique of systemic opioid administration (Owen, McMillan & Rogowski 1990).

Studies such as that by Scott, Clum and Peoples (1983) suggest an alternative method for reducing postoperative pain. They suggest that this reduction in pain may be achieved by identifying preoperative predictors of postoperative pain. Early identification of patient related risk factors which may lead to high pain levels will aid nurses in identifying those patients who are likely to experience high levels of postoperative pain and so plan preoperative nursing strategies tailored to meet specific patient needs. These actions, may result in an increase in patient comfort by reducing pain levels in the postoperative period and so lead to an improvement in postoperative recovery.

In spite of these recommendations, there are few studies reported in the literature which attempt to identify patient characteristics which may assist nurses in the preoperative identification of the patient who may suffer high levels of postoperative pain.

## **1 - 2 Research Purpose**

The overall purpose of the present study was to investigate five factors which have been identified in the literature as having the potential to influence the postoperative pain experience. Three of these factors have not been the subject of any significant degree of investigation. Firstly, the relationship between patient satisfaction with preoperative information and

the experience of postoperative pain. Secondly, the relationship between expectation of postoperative pain and the postoperative pain experience.

The third factor, that of perceived self-efficacy, has only recently been identified as a possible influence on the pain experience. To date no clinical studies have been reported which specifically investigate the relationship between self-efficacy and postoperative pain. Several laboratory based studies have demonstrated a positive relationship between pain tolerance and self-efficacy ( Baker & Kirsch, 1991; Bandura, O'Leary, Barr-Taylor, Gauthire & Gossard, 1987; Litt, 1988). This relationship was also demonstrated in a clinical study by Manning and Wright (1983) which examined self-efficacy and pain control in childbirth.

The significance of age and gender as a predictor of postoperative pain has been the subject of several studies. However the results have been inconclusive as to the effect they may have on pain. It is for this reason that these variables were also examined. Relationships between age and gender and the other variables, expectation, self-efficacy and satisfaction was also be tested.

### **1 - 3 Research Questions and Hypotheses**

This study tested the relationship between postoperative pain levels reported by patients who had undergone abdominal surgery, and five variables identified from the literature:

Specifically, the study addressed the following questions and hypotheses.

### Research Questions

- 1) Is there a relationship between age and postoperative pain?
- 2) Is there a relationship between gender and postoperative pain?
- 3) Is there a difference between patients' preoperative estimation of postoperative pain and the experience of postoperative pain?

### Research Hypotheses

- 1) There is a negative association between satisfaction with preoperative information and postoperative pain?
- 2) There is a negative association between perceived self-efficacy and postoperative pain.

## **1 - 4 Significance and Limitations of the Study**

The current study will make a contribution to the theoretical knowledge base and informed practice of nursing in the postoperative area. It will extend current research into postoperative pain to include areas not extensively studied and attempt to clarify previously inconsistent results



such as those found for the effect of gender and age. These issues are of particular importance to nurses as they affect the nature of preoperative teaching, patient assessment and the provision of effective postoperative pain control. All of these are significant nursing responsibilities.

The generalizability of the conclusions drawn from this study may be limited to:

1. only postoperative patients following abdominal surgery.
2. only those patients under the care of a special unit and who's care is given according to the protocols of the unit. For example an established Acute Pain Service.
3. only those patients who use Patient Controlled Analgesic as their only method of pain control.
4. only English speaking subjects.

To the extent that these patients are representative of other postoperative patients with abdominal surgery, the findings have implications for all post operative patients who have undergone abdominal surgery.

## **1 -5 Definition of Terms**

### **1 - 5.1 Conceptual Definitions**

Of the five concepts studied, two of these, age and gender can be considered as directly observable with empirical referents and will not be discussed further. Three others, satisfaction, expectation and self-efficacy can be considered as highly abstract concepts which are made up of a complex mix of " thought, feeling or process that individuals experience" (McLaughlin and Marascuilo, 1990, p.19,..). These concepts require clarification within the terms of this study. The dependant variable, pain, an abstract concept is also discussed.

*Pain* - In the final statement of the National Institute of Health Consensus Development Conference (1987), pain is described as a subjective experience that can be perceived directly only by the sufferer. It is a multidimensional phenomenon that can be described by location, intensity, temporal aspects, quality, impact and meaning and is made up of four main components, nociception, sensation, suffering and behaviour (Wall and Melzack, p.195 1984). Because there are physiological, psychological and cultural aspects of pain which influence the meaning and experience of pain, Wall and Melzack, believes that it is not possible to establish a linear relationship between the amount of noxious input and the intensity of pain and so it is inappropriate to attempt to judge pain levels using response to noxious stimuli alone. Rather, a measurement framework using physiological, subjective and behavioural indicators is more useful. Of

these measurements, the most useful is a verbal description of the pain given by the individual who is actually experiencing the pain. This personal and verbal description uniquely describes the pain and can not be applied to any other factor. Other such measures, for instance, physiological indicators may be a response to some stressor other than pain (for example fear). While these general indicators may prove useful they are not specific measures of pain and so should only be used in conjunction with a verbal descriptor in order to give a complete picture of the pain being experienced.

*Expectation* - Described as the probability of a thing happening, or anticipation of an event (Derdiarian, 1989). In the context of this study, expectation of postoperative pain is used to describe the subject's anticipation of pain after their operation.

*Satisfaction* - a conceptual definition of satisfaction, an abstract and psychosocial phenomenon, is provided by Linder-Pelz (1982) who noted that satisfaction can be described as the individual's positive evaluations of a distinct aspect of health care. This definition expresses the subjective nature of satisfaction which varies between individuals. A more general definition of the concept describes satisfaction as "being content or pleased, to demand no more" (Macquarie Encyclopedic Dictionary, 1990). Both of these definitions of satisfaction may be applied to preoperative information, in that, although patients are presented with varying amounts and types of information it is necessary for nurses to consider how well that information meets the individual needs of that person.

*Perceived Self-Efficacy* - perceived self-efficacy is defined as a personal conviction or judgment that one can successfully perform certain required behaviours in a given situation ( Bandura, 1986, p. 391). Bandura's discussion of self-efficacy considered it to be situation specific, however Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs and Rogers (1982) extended this to include the concept of general and social self-efficacy based on an individual's personal history. Sherer et al. described general and social self-efficacy as the expectancies which are developed from past experience and then applied to specific situations. It is these concepts which have been applied in this study.

#### 1 - 5.2 Operational Definitions

*Preoperative Information* - all information provided to the patient which describes the procedure and or the postoperative period, regardless of the source of that information. For the context of this study, two different classes of information have been identified. The first, information about postoperative pain and methods of pain control refers to any information given to the subject which has reference to these concepts. The second, general information, refers to all other information excluding that about pain.

Data on both sources of information were collected using likert questions (Appendix III).

*Postoperative Pain Score* - the average of the pain scores for the patient's first day post-operation, taken from the records of the Acute Pain Service. The first day postoperatively is generally considered to be the time patients are likely to experience high levels of pain (McCaffery & Beebe, 1989,p. 52; Melzack , Abbott, Zackon, Mulder & Davis, 1987). Scores are collected by nursing staff caring for the patient as part of normal postoperative care, using the numerical rating scale (Appendix II) and protocols currently in use for patients under the care of the Acute Pain Service.

These scores were used in two forms. The first, as raw data taken directly from the subjects' records, i.e. 0 to 10. These raw scores were used as demographic data to describe the sample. In order to compare the recorded pain scores for each subject with the amount of pain they expected to experience ( recorded as none, moderate, mild or severe) the pain scores were categorised as mild (1-3), Moderate (4 - 6) and severe (7 - 10) (Litt, 1988; Katz & Melzack, 1992). A pain score of 0 indicated no pain was present and so was categorised separately.

*Self-efficacy Score* and *Expectation of Postoperative Pain* results were taken from the Self-efficacy tool (Appendix IV) and likert questions (Appendix III) respectively, completed by the subjects as part of the postoperative interview.

Further discussion of these operational definitions can be found in the methodology chapter.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2 - 1 Introduction**

Throughout medical, social science and nursing literature, empirical evidence highlights the need for, and the importance of, pain relief during the postoperative period. Adequate pain relief has been shown to bring about a reduction in patient morbidity (Crocker, 1986). Conversely, inadequately controlled post-surgical pain may have several undesirable consequences on patient mortality and morbidity (Swiwanakul, Weiss, Alloza, Kelvie, Weintraub & Lasagna, 1983).

Several researchers have demonstrated inadequate pain control in postsurgical patients (Sriwanakul, et al., 1983; Ketovuori, 1987; Melzack et al 1987; Walmsley, Brockopp & Brockopp 1992). It was noted that 80% of patients surveyed reported suffering moderate to severe postoperative pain in spite of the routine use of analgesics. All of these studies noted the adverse effects of inadequate pain control, identifying postoperative complications, delayed healing and prolonged hospital time as the most commonly seen effects. These studies identified the need for improved pre and postoperative assessment and intervention to provide effective measures to ensure patient comfort.

Several factors which contribute to postoperative pain have been identified, many of these, such as anxiety, stress and method of preoperative

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### **LITERATURE REVIEW**

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Several factors which contribute to postoperative pain have been identified, many of these, such as anxiety, stress and method of preoperative

teaching have been extensively studied. Others, such as satisfaction with preoperative information and expectation of postoperative pain have not been subjected to such detailed investigation.

## **2 - 2 Acute Postoperative Pain**

Acute pain is that pain which lasts for more than six months and results from accident, trauma or surgical intervention (Cupples, 1992). Cupples also claims that, although pain is the most common reason why people seek medical advice, it is the least understood of all medical symptoms. Studies show that as many as 80% of postoperative patients suffer moderate to intense pain (Carr, 1990; Ketovuori, 1987; Rees & Davis 1993).

Methods of postoperative pain control provide temporary symptomatic relief (Whipple, 1987) and consist primarily of the administration of one of the analgesic group of drugs, although nonpharmacological methods are gaining popularity (Ferrell, Eberts, McCaffery & Grant, 1991; Whipple, 1987.). A frequently used method of pain control is the administration of intravenous narcotic analgesics, via an intravenous line or alternatively, the relatively new method of Patient Controlled Analgesia (PCA) (Owen, Mather & Rowley, 1988; Paradis, 1992). Patient Controlled Analgesia is based on the theory that as pain is a very personal experience then it is sensible that its control be placed in the hands of the patient (Paradis). This control is achieved by allowing the patient to activate a demand button which delivers a predetermined intravenous dose. Several studies (Ferrante, 1992; Owen et al., 1988; Paradis) list speed of relief, improved locus of control and better pain control with less side effects as among the



advantages of PCA. The use of PCA does not guarantee complete relief and is not suitable for all patients, Rees and Davis (1993) in a descriptive study involving 478 subjects, found that patients who had undergone various types of operation and who used PCA, reported significantly higher pain scores than those using either the Intravenous infusion or Intramuscular injection method of analgesic administration. No explanation was offered for this finding. Also, it is not clear what other variables may effect the pain scores of patients using PCA and it is this aspect the current study addressed.

## **2 - 3 Expectation of Postoperative Pain**

In a study based on a cognitive information processing model Wallace (1985) proposed that accuracy of pain expectations about an impending threat determines the intensity of the patient's response to that threat. Wallace was able to demonstrate a reduction in postoperative pain and distress after preoperative intervention which was designed to allow the subject develop accurate expectations regarding postoperative pain. This intervention took the form of a specially prepared booklet which outlined common pain sites and methods of control. A significant difference between the experimental and control groups was noted ( $f(2,61) = 5.4, p = .008$ ). This study supported earlier work by Johnson (1978) who found that not only the presence of a discrepancy influenced pain and distress, but also the direction of the discrepancy was also important. That is, if the subject experienced more pain than they had expected, they also experienced higher levels of postoperative distress, which in turn resulted in increased pain levels.

In a study involving 101 subjects, Walmsley, Brockopp and Brockopp (1992) deliberately selected an older subject group (47 - 87 years) because ....of the confusion regarding management of pain within this group.

However, even though the age of their sample had a 40 year range, Walmsley et al. did not examine the data for any effect age may have on the postoperative pain experienced by their subjects, their interest centred on how prior pain experience influenced expectation of pain. Using a stepwise multiple regression ( $r = .51, f = 12.33, p .0001$ ), they found that prior pain experience was the strongest partial correlate of expected pain ( $r = .34$ )

Both Scott et al. (1983) and Camp and O'Sullivan (1987) recommend further investigation should be undertaken in an attempt to clarify the relationship between these two variables and the postoperative pain experience. There has been a large volume of research relating to acute pain reported in the literature and in almost all cases the subjects' ages and gender are reported as part of the description of the sample. In spite of inconsistent results and recommendations for further investigation, this are few studies which have examined this wealth of data for any effect these two variables may have on the experience or reporting of pain.

As with the question of expectation, the present study re-examined these variables using a single operative group in an attempt to contribute to the debate on this topic.

## **2 - 5 Self-Efficacy**

Over the last decade, interest in self-efficacy theory has grown substantially (Dolce, 1987) and recently, investigators have begun to examine the relationship between self-efficacy, pain perception and pain management. In describing his original theory in 1977 Bandura built upon social learning theory to distinguish between self-efficacy expectancies and outcome expectancies, this theory was further refined in 1987. Outcome expectancies are beliefs that a behaviour will result in a particular outcome and self-efficacy expectancies are beliefs that an individual can successfully perform the behaviour on which the outcome is based (Baker & Kirsch, 1991). A large body of research suggests that specific self-efficacy estimates can be used to predict behavioural outcomes across a large range of behaviours. A relationship has been demonstrated between self-efficacy and pain tolerance in several laboratory based studies (Bandura et al., 1987; Dolce, Doleys, Raczynski, Lossie, Poole & Smith, 1986; Litt, 1988. and Wiesenberg, Wolf, Mittwoch, Mikulincer & Aviram, 1985). A study by Litt (1988) which tested the predictive ability of self-efficacy expectations using 62 subjects supported the theory that self-efficacy expectations did significantly predict changes in performance. In a similar laboratory based study ( $N=64$ ) Dolce et al. (1986) reported a significant correlation between self-efficacy and tolerance ( $r=.66, p<.001$ ). However no correlation was found between self-efficacy and pain rating.

Although the vast majority of research in this area has taken the form of laboratory based studies, several clinical studies have been undertaken. Two of these studies (Lowe, 1991; Manning & Wright, 1983.) used self-

efficacy theory as the framework for studying women's ability to cope with labour (Lowe) and the relationship between maternal self-efficacy and the persistence of pain control in childbirth (Manning). In both these studies, maternal self-efficacy was demonstrated to have a positive effect on the outcome under investigation. Only one study has examined self-efficacy theory related to the area of postoperative care. This study conducted by Oetker-Black, Hart, Hoffman and Geary (1992) on 70 female patients, examined the relationship between self-efficacy and postoperative behaviours (eg. deep breathing, analgesic request) was examined. Significant though weak correlations were reported between self-efficacy and all the behaviours, deep breathing ( $r = .20$ ), requesting pain medication ( $r = .18$ ), ambulation ( $r = .26$ ) and recollection of preoperative events ( $r = .24$ ). Based on these results, Oetker-Black et al. claim that self-efficacy is positively correlated to postoperative behaviours. No studies were located which studied the relationship between self-efficacy and postoperative pain, and it is this area which the present study addressed.

Bandura (1977) also suggested that an individual's history of varied and numerous success' would also effect their self-efficacy expectancies. This expansion of self-efficacy theory was further developed by Sherer et al. (1982) who suggested that measurement of generalised rather than situational specific self-efficacy expectations is of value in situations which are ambiguous or in which the individual has little or no experience or information, for example ill health. Sherer reasoned that if the individual had only limited knowledge of the situation, they could not develop self-efficacy expectations related to that situation. Therefore, general and social self-efficacy was a more reliable measure. The tool developed by Sherer et

al. is based upon this concept of general and social self-efficacy and has been applied in several areas of health care.

## **2 - 6 Patient Satisfaction With Preoperative Information**

Ley (1988, p.1) points out that patient satisfaction is a desirable goal in it's own right, but that it also has the added importance of improving compliance with advice and can reduce patient stress levels. Ley also reports a correlation ( $r=0.54$ ) between an individual's satisfaction with the information received about their treatment and the degree to which that information prepared them for that treatment. The suggestion made by Ley is that if the type and level of information given meets the individual's needs, then the level of satisfaction will be high. In a meta-analysis of studies conducted between 1960 and 1985, Ley (p. 10) noted that the percentage of patients dissatisfied with the information they received ranged up to 65%, with a minimum of 17%.

Studies such as those carried out by Scott et al.(1983), Johnson and Rice (1974) and Bray (1986) have provided information on the relationship between the amount of information an individual is given about an operative procedure and the resulting postoperative pain. However, these studies have produced conflicting results as to how that information affects postoperative pain. Scott, et al. (1983) found a significant positive correlation ( $r=.33$ ,  $P=.01$ ,  $N=48$ ) between levels of information and measures of postoperative pain, suggesting that high levels of information about impending surgery was predictive of higher levels of pain. These

findings are in conflict with those of Johnson and Rice (1974) who found that higher levels of information reduced postoperative pain.

When comparing their results with those of previous studies, Scott et al. (1983) noted significant differences in the type of preoperative information given in the various studies. These observations led Scott et al. to suggest that one explanation for the different outcomes may be provided by examining the content of the preoperative information the patient received. This conclusion was supported by Langer ( in Scott et al.,) who found that information on impending discomfort may "sensitize" some patients and this may lead to increased postoperative pain. Johnson and Rice (1974) concluded that it is the amount and content of information that the patient seeks is significant, as did Bray (1986) who demonstrated that too much or too little information contributed to increased anticipatory anxiety, a recognized contributing factor to increased postoperative pain ( Scott et al. 1983).

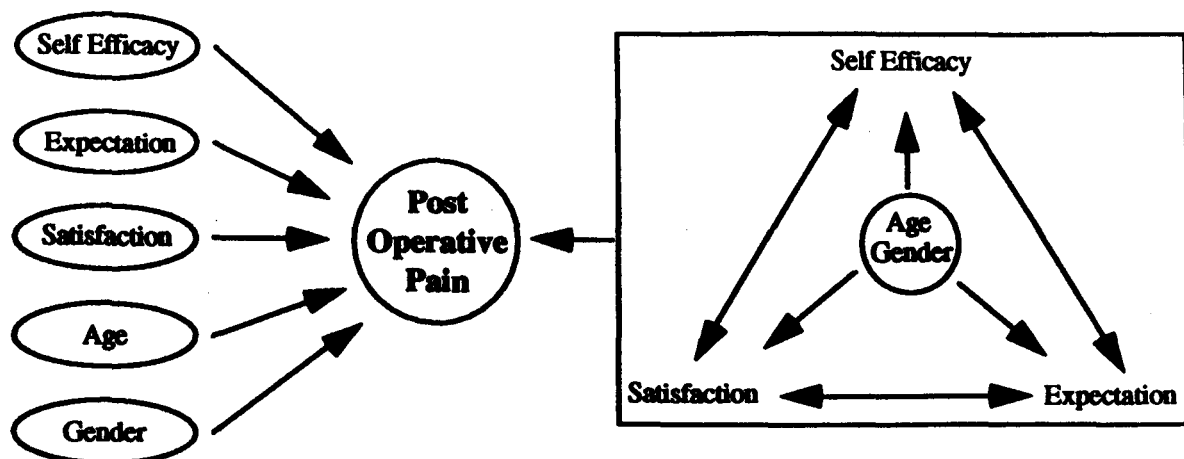
These studies suggest that it is the extent to which the preoperative information given meets the individual needs of the patient which is significant, not the amount of information. In their study, Thompson, Webster and Meddis (1990) concluded there was a positive relationship between patient satisfaction with the preoperative information they received and how well that information met the individual needs of the patient. They suggested that if the patient's need for preoperative information can be met, their satisfaction in this area will be increased and this may lead to decreased postoperative pain. Thompson et al. further recommended that patient satisfaction should be recognised as an important dimension of the provision of good care and a factor which may affect the post operative

outcome including postoperative pain. However, to date there does not appear to be any empirical evidence to support this view.

There are no reported studies, either in Australia or overseas which investigate the relationship not only of age, gender and postoperative pain, but any association which may exist between age, gender, expectation and satisfaction and self-efficacy.

## **2 - 7 Proposed Theoretical Model**

From the review of the literature a proposed model was developed which demonstrates the interaction of the five selected variables and their effect on the experience of postoperative pain (Figure 2.1). The independent variables, expectation, satisfaction, self-efficacy, age and gender as represented by the left hand side of the model all have a direct and individual influence on postoperative pain. These variables are again represented in the right hand side of the model as having an indirect effect on postoperative pain via interaction one with the other.



**Figure 2.1 Predictors Of Postoperative Pain**

## 2 - 7 Summary

Examination of the literature has revealed considerable research on pain, and that much of that research has considered acute postoperative pain. It is clear however, that the possible effects of satisfaction with preoperative information and patient preoperative expectation of postoperative pain on the postoperative pain experience are not well understood. What studies have been carried out show little consensus. Further, the studies which have been reported have focused on patients who are receiving analgesia via traditional methods, no work has been reported on those patients using the Patient Controlled Analgesia method.



Similarly, there is little reported work on the clinical application of laboratory based results of the relationship between self-efficacy levels and the individual's response to pain.

The study also examined age and gender in an attempt to identify what effect these variables may have on a single operation group. The study also aimed to identify what relationship, if any, exists between expectation of postoperative pain, satisfaction with preoperative information and self-efficacy, and the experience of postoperative pain.

The issues examined by this study are of particular importance to nurses as they may influence the nature of preoperative teaching, patient assessment and the provision of effective postoperative pain control, all of which are significant nursing responsibilities.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3 - 1 Introduction**

As discussed in earlier chapters, this study examines some of those factors which are thought to influence the pain experienced by patients postoperatively. As it is not possible to study the entire population of postoperative patients, a sample of patients who had undergone a specific type of surgery was selected. The study was ex post facto and correlational in nature. A cohort of postoperative patients was interviewed once only, between three and five days postoperatively. The interview format and research tools were based on previous studies reported in the literature.

#### **3 - 2 Sample**

A convenience sample of 60 subjects was included in the study. In an effort to reduce sample bias collection of data was not carried out during the holiday period which was considered to be nonrepresentative as there were no booked admissions at this time and it was expected there would be a disproportionate number of admissions as a result of accidents.

### 3 - 2.2 Selection of Subjects

To be included in the study subjects were required to meet the following criteria .

1) Be over 18 years of age

2) Have been under the care of the Acute Pain Service (Appendix I) within the last 48 hours. The use of this specialist service which has established protocols for the administration of analgesia and the assessment and recording of postoperative pain levels allowed patients from different wards and under the care of different medical teams to be compared. Staff from all areas of the hospital are trained in the use of these protocols and so a high degree of consistency is to be expected.

3) Have undergone abdominal surgery during the current admission. The study was restricted to this type of surgery because while the inflammatory response to surgery is the same in every case, the pain experienced by the patient may vary due to trauma to the type of tissue involved (Bray, 1986; Donovan, 1983).

4) Report no previous chronic pain. Reports in the literature suggest that patients who suffer chronic pain may put different emphasis on pain control and respond differently to some analgesic drugs ( Taenzer, Melzack & Jeans, 1986).

5) Can speak and understand English. It was considered inappropriate to use interpreters because of the personal nature of some of the questions and the costs associated with the employment of interpreters.

6) Have used Patient Controlled Analgesia as the only method of pain control. The use of this method of pain control allows standardised analgesic solutions to be administered and reduces the risk of delays in the requested analgesic being given, thus reducing the risk of these factors affecting the amount of analgesic used and the levels of pain reported by the patient ( Mather & Owen, 1988; Owen, et al. 1988; Shade, 1991). A study by Rees and Davis (1993) also found a significant difference in the pain scores reported by patients using different methods of pain control. Use of a single administration technique will control for this factor.

All subjects who met these criteria and agreed to take part were included in the study. The only exception to this selection was those patients who had undergone Appendicectomy, and who were also part of another study. These patients were excluded in order not to bias either study or place undue strain on the subjects.

Patients who met the selection criteria of operation type and use of Patient Controlled Analgesic were initially identified from the daily record of the Acute Pain Service.

Data were collected over a 14 week period from December 1992 to March 1993 which was considered representative of the hospital's activities. The

period over the Christmas/New Year holiday was excluded as previously discussed.

Sixty four potential subjects were identified from the records, of these, 58 were interviewed, 1 refused to take part in the study, 2 were too ill to be interviewed and 3 were discharged before the interview could take place. Subjects were interviewed between 2 and 5 days postoperation, with the average time being 5 days. This variation in number of days between operation and interview was a result of the variation in the number of days the subject stayed under the care of the Acute Pain Service, the interview could not take place until discharge from this service.

### **3 - 3 Instruments**

Four instruments were used to collect the data, these being the Self-Efficacy Instrument (Sherer et al., 1982), Patient Satisfaction Questionnaire (Hindshaw & Atwood, 1981), Expectation of Postoperative Pain Questionnaire (Owen McMillan & Rogowski, 1990) and the Numerical Rating Scale for the Assessment of Pain (Carr, 1990). Each of these research tools is discussed below under individual headings.

1) *Self-efficacy Scale* - this scale (Appendix IV) developed by Sherer et al. (1982) was used to measure subjects self-efficacy levels. The scale measures social self-efficacy and general self-efficacy and incorporates 30 statements about personal attributes and traits with responses in the form of a five point Likert scale ranging from strongly agree to strongly disagree. Reliability of the Self-efficacy Scale was measured using Cronbach's alpha

and was reported at 0.86 for the general scale and 0.71 for the social scale (Sherer et al., 1982). Construct validity was tested against several other personality characteristics which are considered to be related to self-efficacy. A later study by Sherer and Adams (1983) reported similar results. The questionnaire has been used in a variety of situations using both clinical and laboratory settings. This application included an Australian study by Percival (1990).

2) *The Patient Satisfaction Instrument* - this section of the postoperative questionnaire ( questions 5 - 9 in Appendix III) consisted of four closed questions answered on a five point Likert scale which allowed quick decision making and one open ended question which allowed the respondents to elaborate if they felt they wished to. Responses to the open ended question were coded and analysed. These questions were taken from a questionnaire developed by Hindshaw and Atwood (1981) which in turn, is based on one developed by Risser (1975). Both these tools were developed to measure patient satisfaction with nursing care. As the questionnaire is very extensive and covered areas not included in this study, only the subscale relating to patient's satisfaction with education was included. These tools have been used extensively and been subjected to several replications to test their reliability (La Monica, Oberst, Madea & Wolf, 1986; Wyness, 1990). In all cases the questionnaire developed by Hindshaw and Atwood (1981) demonstrated satisfactory internal consistency estimates. In a study of 88 subjects, Hindshaw and Atwood reported Cronbach's alpha coefficients ranging from a minimum of 0.64 to a maximum of 0.84 on the three subscales of the tool. The reported alpha for the education subscale was .83. Construct validity of the questionnaire was

estimated by convergent/discriminance techniques. In terms of convergent validity, the patient satisfaction subscales strongly correlated ( $r's = .73 - .77$ ). Discriminance was tested using analysis of variance among different groups of subjects responding to the same instrument before and after educational intervention. The satisfaction with education subscale behaving as predicted ( $p < .05$ ), showing positive patient satisfaction differences after intervention.

3) *Expectation of Postoperative Pain Questionnaire* - of the four questions (questions 1-4 in Appendix III) used to examine this construct, three are answered on a Likert scale, one question requires the subject to rate the pain they experienced using a numerical rating scale described below. These questions were developed in a questionnaire used by Owen et al.(1990) and formed the base of a descriptive study of 259 patients of a large Australian hospital.

The risk of recall bias being introduced by the use of this questionnaire which is based on recalled data, was addressed by the use of a small ( $N=10$ ) study. The subjects included in this section of the study were interviewed the day before their operation and questioned as to much pain they expected to have after their operation. These same subjects were interviewed again as part of the main group. Each subject's preoperative answer was then compared to their postoperative response. The same question, "how much pain do/did you expect to have after your operation" was asked at each interview. This comparison was used to determine consistency of response.

4) A *numerical rating scale of Pain intensity* - used to measure postoperative pain levels (Appendix II) This scale is used in a wide variety of clinical situations to rate pain subjectively (Chapman, Casey, Foley, Gracely & Reading, 1985) and is considered a valid tool with which to gather data on clinical pain (Chapman et al., 1985; McGuire, 1983). The numerical rating scale is currently in use within the study area and the method of collecting and charting the data is subject to established protocols.

### **3 - 4 Procedure**

#### **3 - 4.1 Pilot Study**

A pilot study was undertaken to measure the readability and utility of the survey instrument, to test the data collection methods and to ensure that coding and entry methods were both accurate and efficient. Verbal questioning of participants upon completion of the inventory gathered their impression as to the clarity of instructions, the readability of the items and the ease of reading. This assessment was followed by discussions between the researcher and hospital staff as to the efficiency of the collection process and the likely difficulties these processes may present for both staff and subjects. Entry and analysis of the data collected was undertaken to ensure that the data was in a usable form and that the data sheets were accurate and efficient.



As a result of the pilot survey which involved 14 subjects, minor changes were made to the format of the questionnaire, such as larger print size and an expanded verbal instructions for the Self-efficacy scale tool. Identification of potential subjects was changed slightly to fit more closely with the routine days abdominal surgery was generally undertaken within the hospital.

### 3 - 4.2 Data Collection

Data were collected from both patient records, by the subject filling in the Self-efficacy questionnaire and during a structured interview conducted by the researcher.

An interview was considered the most appropriate method because it was unlikely that a postoperative patient would give priority to a questionnaire and so fail to complete and return the questionnaire. Also, as some of the questions need careful explanation in order for the subject to be quite clear as to which time frame the questions were referring (ie. preoperation or postoperation) and personal explanation and clarification was necessary to avoid misunderstanding. This clarification would not be possible if a self-completion questionnaire was used.

The distribution and collection of questionnaires also presented difficulties in a large and busy hospital where it could be considered unreasonable to ask the staff to add to their workload by undertaking this task.

Personal contact was also considered important to assure the subjects that their privacy would be maintained and to reinforce the fact that their treatment would in no way be affected by their agreement or refusal to take part in the study.

Preoperative interviews were not considered a feasible method of gathering data from the subjects for the main study due to the unreliable nature of both non-emergency and emergency listing for operation. However, the limited number of subjects needed for the confirmatory study were identified from the daily records of the Booked Admissions Department and operation lists. These subjects were asked to take part in both the preoperative and postoperative sections of the study.

In an attempt to reduce interviewer bias, all data were collected by the researcher thus avoiding problems with interrater reliability, and by the use of a script for use during the interview which ensured that subjects were instructed in the use of the questionnaires in a similar manner. All interviews took place at the bedside.

Subjects were identified by way of the records of the Acute Pain Service which were checked by the researcher on a daily basis. All data relating to the postoperative period was collected while the subject was still an inpatient of the hospital. Subjects were approached by the researcher within forty eight hours of their discharge from the Acute Pain Service and invited to take part in the study. This time was considered appropriate as in most cases the patients were three to five days post operation and so should be experiencing a reduced level of pain ( Melzack et al., 1987) and be

receiving reduced doses of narcotics ( a criteria of discharge from the Acute Pain Service). Data collected by the researcher during a structured interview with the subjects included the administration of a single questionnaire, made up of the Patient Satisfaction Questionnaire and the Expectation questionnaire. This questionnaire was completed by the researcher asking the questions and recording the answers directly onto the data entry sheet. During this interview subjects were encouraged to be completely honest in the answers they gave. This was considered particularly important as questions regarding patient satisfaction introduce a possible risk to the study's internal validity because the interviewer's presence may inadvertently sensitize the subjects to respond in a manner which they perceive as desirable (Roberts & Burke, 1989, p. 243). Subjects were also reassured of their privacy and the voluntary nature of their participation. The Self-efficacy Scale was left with the subject to be filled out while the researcher gathered demographic data from patient records, this allowed the subject time to consider his/her answers in private. Demographic data of age, gender, weight, pain score, narcotic use and type of operation was obtained from individual patient records.

### **3 - 5 Ethical Considerations**

Approval and permission for the study was obtained from the Ethics Committees of Edith Cowan University, the hospital, the Director of the Acute Pain Service, the director of surgery and the Director of Nursing of the hospital in which the study was conducted.

The confidentiality of all data was ensured by using only a study number to identify the questionnaires, no patient identification is included in the data base. The nurse in charge of the subject's care was also consulted as to the subjects' suitability for interview.

The researcher introduced herself to the patients as a nurse researcher interested in their opinion and experience of postoperative pain. A detailed explanation of the study was then given. Before any information was gathered, informed consent was obtained from all respondents who choose to participate in the study . A guarantee of confidentiality was given ( see Appendix V ) as was the assurance that refusal to participate would not in any way affect the treatment received.

Subject interviews were scheduled so as not to interfere with treatment and were kept to a maximum time of 15 - 30 minutes so as not to place added strain on the patient.

Where appropriate, requests for permission to use research instruments were made.

## **CHAPTER 4**

### **DATA ANALYSIS AND RESULTS**

Data analysis was carried out using the Statistical Package for the Social Sciences (SPSS). Screening of data was carried out using a checklist described by Tabachnick and Fidell (1987, p.78). Areas examined included screening of univariate statistics for accuracy of input, identification of missing data and outliers. Variables were checked for skewness and kurtosis, nonlinearity and heteroscedasticity. Examination of scatter plots demonstrated that the data were normally distributed, linear and homoscedastic. No outliers or missing data was identified. The only transformation of data carried out was the categorising of the raw pain scores as mild, moderate or severe in order to allow more accurate comparison with recalled data. This transformation is described in chapter 1.

#### **4 - 1 Description of Sample**

Data were collected from a convenience sample of 58 subjects, 57% of whom were male and 43% female. The ages of the subjects ranged from 17 years to 87 years ( $M = 55$ ,  $SD=16.5$ ).

Gender and age distribution of this sample was compared to that reported in an earlier study by Rees and Davis, (1993) which included the total number of patients treated by the Acute Pain Service over a six month period (Table 4.1). In each case the variables compared showed little variation.

This result suggests that the present study subjects are representative of patients from this particular hospital unit.

**TABLE 4.1** *Composition of Sample Compared to Acute Pain Service (APS) Population*

	APS Records	Current Study
Mean Age	53 (14-94)	55 (17-87)
Gender	Male = 54% Female = 46%	Male = 57% Female = 43%

As described in the section on procedure, all subjects had undergone abdominal surgery in the current admission. The largest group were those who had undergone surgery for some form of abdominal cancer, most of these subjects had a surgical diagnosis of bowel resection. The subjects who had undergone an Appendicectomy, formed the next largest group and it was these subjects who formed the youngest age group. Several operation types made up the remainder of the sample, these are listed in Table 4.2.

**TABLE 4.2 Operation Type**

OPERATION	f	%
Bowel Resection	25	43.1
Appendicectomy	8	13.8
Laporotomy	5	8.6
Splenectomy	5	8.6
Cholecystectomy	4	6.9
Hysterectomy	3	5.2
Other	8	13.8
	N=58	

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Other = Vagotomy, Hepatectomy, subphrenic Abscess, Prostatectomy, Gastrectomy.

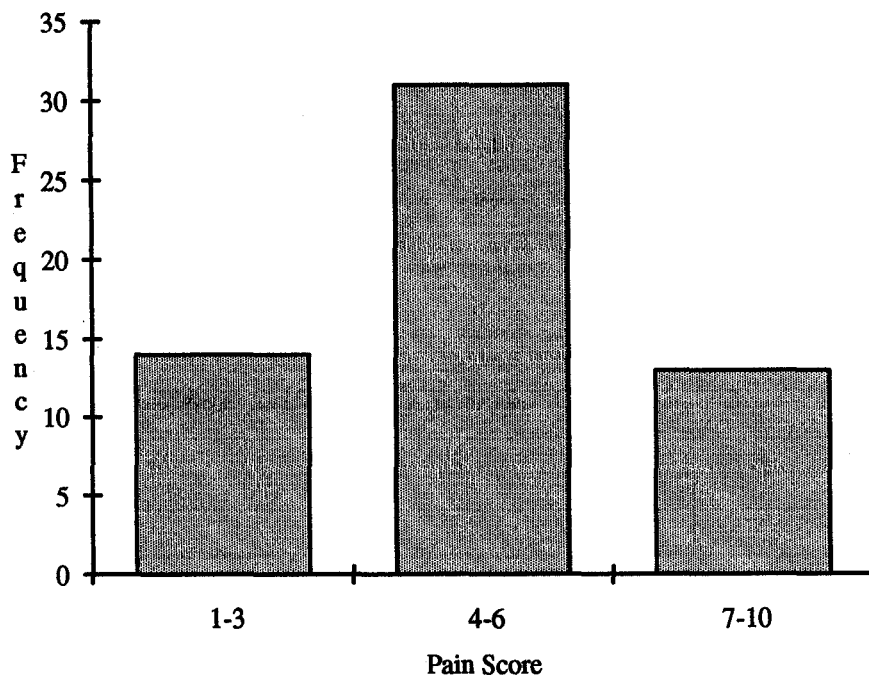
#### 4 - 1.2 Postoperative Pain Score

Measurement of postoperative pain was by way of a scale of 0 to 10, 0 being no pain present and 10 being the worst pain imaginable. The recorded pain scores of the subjects ranged between 1 and 10 ( $M= 4.84$ ). Only one subject reported a pain score of 10, the same subject reported expecting "unbearable pain" postoperatively. Distribution of categorised pain scores is shown in Figure 4.1.

#### 4 - 1.3 Difference Between Pain Scores, Based on Diagnosis of Cancer

In order to test for differences between pain scores of those subjects with cancer and those without, an independent t-test was performed with pain score as the dependent variable and diagnosis of cancer the independent variable. For the group with a diagnosis of cancer the mean was 4.6 ( $SD=1.5$ ) and for the noncancer group the mean was 5.1 ( $SD=2.6$ ),  $f=10.5$  ( $p=.002$ ). The results of t-test were  $t(56) = .67$   $p = .51$

As no significant difference was found between the groups, the sample was regarded as a single group and analysed accordingly.

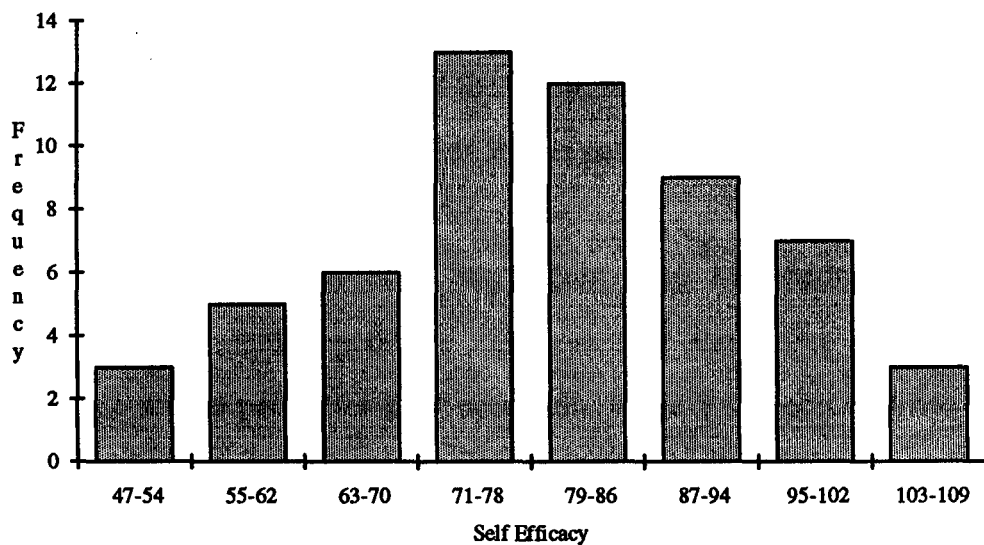


**FIGURE 4.1** *Pain Scores for the First Day Postoperation*



#### 4 - 1.4 Self-Efficacy Scores

Subjects' social and personal self-efficacy was measured by way of a questionnaire with a maximum possible score of 110. Subjects scores ranged between 47 and 109 with a mean of 79.64 ( $SD=15.02$ ). Distribution of self-efficacy scores is shown in Figure 4.2.



**FIGURE 4.2** *Subjects' Self-efficacy Scores*

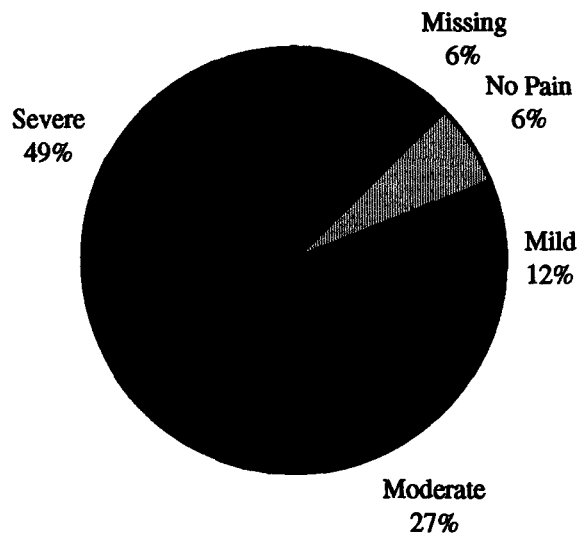
#### 4 - 1.5 Expectation of Postoperative Pain

As a test for the stability of recalled data, and to ensure that the information about how much pain the subject recalled expecting to experience was in fact an accurate reflection of what actually was expected, a small ( $N=10$ )

subsample of subjects was interviewed preoperatively and asked how much pain they expected to experience. Using a paired t-test this preoperative expectation was compared with the subject's answer to the standard question regarding expectation of postoperative pain asked at the postoperative interview. The results of a paired t-test carried out on these variables showed no significant at difference at alpha =.50, between the answers given preoperatively and those given during the postoperative interview ( $t(9) = .56$ ,  $p = .591$ ).

The results of this analysis demonstrated the subjects' ability to recall data accurately even several days after the event, and suggests that collection of this type of recall data is appropriate in this particular setting.

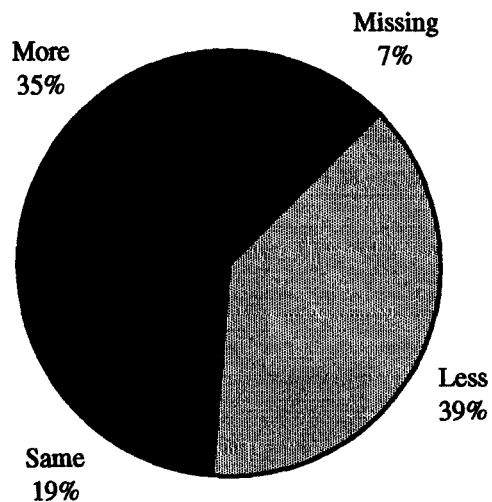
All subjects were asked how much pain they had had expected to experience after their operation. Almost half the group expected to experience severe pain after their operation, while 3 subjects claimed they had not given this subject any consideration. (Figure 4.3 )



*Missing = subjects who did not think about how much pain they would have*

**FIGURE 4.3** *Expectation of Postoperative Pain*

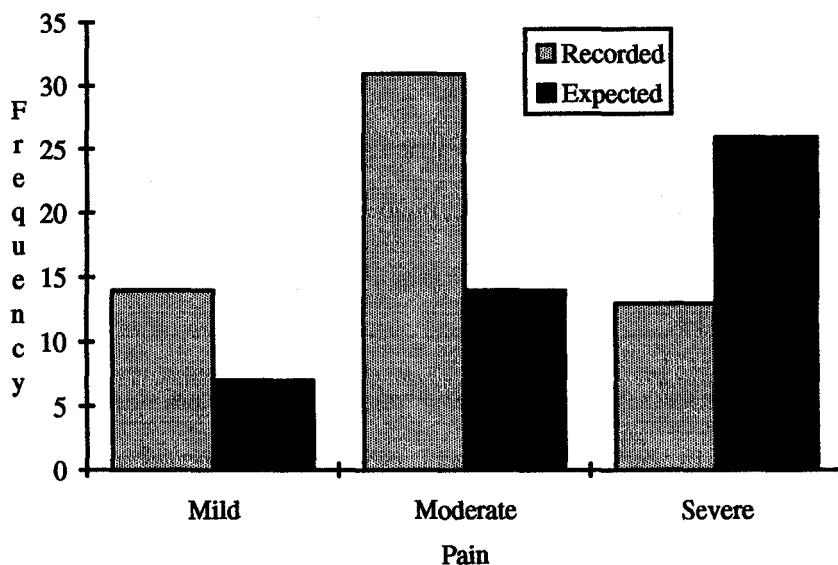
Subjects were also asked to compare the pain they actually experienced postoperatively with how much pain they expected to have. The sample was almost equally divided between the three options of "more pain than expected", "about the same" and "less than expected", These results are shown in Figure 4.4.



*Missing = subjects who did not think about how much pain they would have*

**FIGURE 4.4** *Expectation Verses Experience of Postoperative Pain*

It was of interest to compare the recorded pain scores ( in terms of mild, moderate or severe ) with the amount of pain the subjects had expected to experience after their operation (Figure 4.5). These scores show very little consistency, supporting the previous finding that a large proportion of the subjects had expectations of postoperative pain which were incongruent with the actual experience. To test the relationship between these variables, Pearson's product moment correlation was performed, significant correlation was found (Table 4.4).



**FIGURE 4.5** *Comparison of Expected Postoperative Pain and Reported Pain Scores.*

#### 4 - 1.6 Preoperative Information

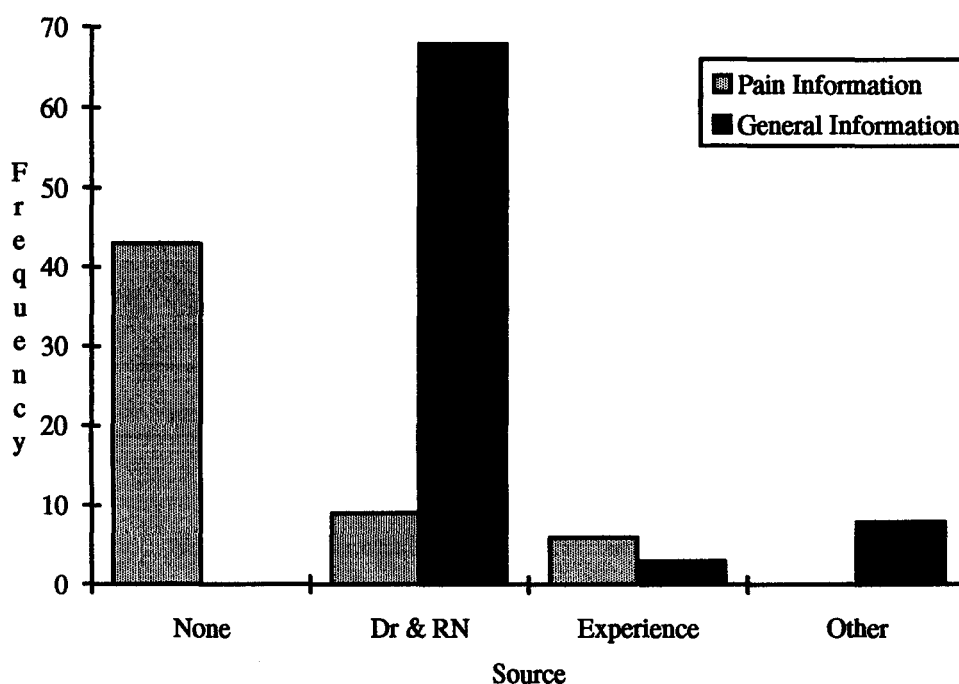
Forty three subjects reported that they had received no specific information about how much pain to expect after their operation or about methods of pain control available to them. Of the remainder, 6 subjects had used information gained from previous surgery and a surprisingly small group of 9 subjects reported information given by doctors or nurses.

Because there was such a large group of subjects who had not received any specific pain information, it was of interest to investigate the effect this lack

of information may have had on the reported pain scores. Data were categorised into two groups, those reporting information and those who could not recall receiving specific information about postoperative pain. An independent t-test was performed with pain score as the dependent variable. The means of the no information group and the information group were  $M=5.1$ ,  $SD=1.94$  and  $M=4.2$ ,  $SD=1.96$  respectively. No significant difference between the groups was shown  $t(56) = 1.5$   $p=.14$ .

All subjects reported they had received general information about what to expect after their operation, most identifying more than one source of information. This multiple reporting by most subjects resulted in a larger number of responses than subjects. For clarity, the number of responses identifying nurses and doctors is shown as one group.

Figure 4.6 shows the sources of information identified by the subjects for both specific pain information and for general information.



**FIGURE 4.6** *Information Given To Subjects Preoperatively*

#### 4 - 1.7 Overall Satisfaction With Information

When asked if they were satisfied with the information they received before their operation, 33 (57%) subjects stated that they were not satisfied with the information they received. Those people who reported being satisfied with the information were either satisfied ( $n=20$ , 33%) or very satisfied ( $n=5$ , 10%) with the information they received.

Reasons for dissatisfaction with preoperative information were varied, with the most common being that not enough information was given ( $n=23$ ). Information which was too technical or difficult to understand was listed as

the reason for dissatisfaction by 9 subjects. Table 4.3 gives the breakdown of reasons given by the subjects.

**TABLE 4.3** *Reason for Dissatisfaction With Preoperative Information*

Reason Given	f	%
Not enough information given	21	48
Information was too technical	9	22
Too much information given	6	14
Too much information on "How bad the operation will be"	4	10
Information was conflicting	3	7
Responses	n=	43
Subjects responding to this question	n=	33

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Note: some subjects gave more than one reason

The subjects were also asked to use the benefit of hindsight to judge how useful the preoperative information was to them in their postoperative period. They were asked to include all the information they had received no matter what the source or topic. This question was aimed at testing how



well the information had met the subjects' individual need for information. Thirty six (62%) of the subjects reported that the information was of no use or of only a little use to them. Twenty two (38%) reported that the information was useful or very useful.

In response to the question on how worried the preoperative information made them, a large percentage (45%,  $n=26$ ) of the subjects reported no change in how worried they felt. Forty seven percent ( $n=27$ ) reported being worried or very worried by the information they received. Only 5 subjects (8%) felt that the information reduced their worry levels.

#### **4 - 2 Comparison of Subjects' Recalled Pain Score and Recorded Pain Score First Day Postoperation**

It was both of interest clinically, and important as a test for the stability of recalled data to examine whether the subjects' recall, several days later, of the amount of pain they had experienced on the day after their operation was an accurate indication of the amount of pain they had actually reported to nursing staff on their first day postoperation. The subjects' recalled pain score as given to the interviewer several days after operation was compared to the pain score recorded in the subjects' nursing notes for the same time period, ie. the first day postoperation.

To test for differences between the two groups of scores, a paired t-test was performed. The results of this t-test showed means of  $\bar{M}=5.4$ ,  $\underline{SD}$  2.2 (recalled score) and  $\bar{M}=4.8$ ,  $\underline{SD}$  = 2.0 (recorded score) with  $t(56) = 3.1$ ,  $p =$

.004. Although these results show a statistically significant difference between the means it is questionable whether this difference of .6 is significant in the clinical areas. In this setting patients are asked to rate their pain using whole numbers only and a variation of one unit of measure between successive pain scores is not generally considered unusual. In order to try and clarify this inconsistency between statistical and clinical significance, a Pearson's Product Moment Correlation was performed to examine the relative strength of association between the variables. The calculated coefficient showed a strong positive correlation ( $r(56) = .84$   $p = <.001$ ) between the two variables. This strong correlation indicates that subjects, relative to each other, can accurately recall past experience of pain.

#### **4 - 3 Analysis of Relationships Between Pain Score and the Independent Variables**

A regression analysis was undertaken to test the three questions and two hypotheses formulated for the study. In all cases the alpha level set at .05. The analysis examined the relationship between the dependent variable pain and the five independent variables, age, gender, self-efficacy, satisfaction and expectation. As the first step, Pearson's Product Moment Correlation coefficients were calculated. These results are shown in Table 4.4.

**TABLE 4.4 Correlational Matrix**

	Age	Gender	Expect.	Satis	Self-eff
Gender	.03				
Expect	.31*	-.22			
Satis	.26*	-.18	.21		
Self-Eff	-.18	-.14	-.02	-.30*	
Pain	-.067	.07	-.02	-.47	-.47*

Expect = Expectation

Pain = Pain Score

Satis = Satisfaction

Self-Eff = Self-Efficacy

\*  $p < .05$  $DF = 56$ 

Each question and hypothesis was examined to identify any relationships which may be present.

The correlational analysis did not support any association between age and pain, or between gender and pain. However, the relationship between satisfaction with preoperative information and postoperative pain was negative as predicted although failing to reach the required level of significance. ( $p = .091$ ).

The stated hypothesis for the variables self-efficacy and postoperative pain predicted a negative relationship between these variables. The Pearson's correlation coefficient showed a significant relationship between these variables, ( $r(56) = -0.4745, p < 0.001$ ). This association was also negative as predicted, thus an increase in self-efficacy is associated with a decrease in postoperative pain.

Several weak to moderate significant associations between independent variables were noted in the correlational matrix (Table 4.4). The age of the subject was correlated with two other independent variables, one being expectation ( $r(56) = .31, p < .05$ ), indicating that as the age of the subject increases they expected to experience more postoperative pain. Age was also correlated with satisfaction ( $r(56) = .26, p < .05$ ), suggesting that the older the subject, the more satisfied they were with the preoperative information they were given. Satisfaction was also significantly associated with self-efficacy ( $r(56) = .30, p < .05$ ) which suggests that subjects who reported high self-efficacy expectation on the general and social scale were more likely to be satisfied with the information they were given.

In order to investigate the relationship between the dependent variable postoperative pain and the independent variables self-efficacy, expectation, age, gender and satisfaction Stepwise Multiple Linear Regression Analysis was undertaken. Tabachnick and Fidell (1987, p151) recommend this as the appropriate test when the independent variables are uncorrelated or only weakly correlated. Adjusted  $R^2$  was examined to determine the proportion of the variation in the dependent variable which can be explained by the model.

To assess the relative importance of each of the independent variables the BETA coefficients, that is the standardised form of the partial regression coefficients were reported. The use of these particular coefficients was considered appropriate because the independent variables are not measured in the same units therefore the unweighted coefficients (B) are unable to be directly compared. Accuracy of prediction is demonstrated by the standard error.

The multiple regression outcomes are shown in Table 4.5. R for regression was not significantly different from zero, with  $F(56) = 3.41$ ,  $p = .009$ .

Of the four independent variables entered into the equation, only one, self-efficacy contributed significantly. This variable accounted for 21% of the variation found in the dependent variable Pain Score.

The adjusted  $R^2$ , calculated at 0.21, may be interpreted as the proportion of the variation in the dependent variable which can be explained by the model (Norusis, 1983). Addition of further variables resulted in a decrease in the prediction. Accuracy of prediction is demonstrated by the standard error of 1.8.

**TABLE 4 - 5 Stepwise Multiple Regression Of Self-efficacy, Age, Satisfaction, Cancer and Expectation and Pain Score.**

Variable	Mean	SD	B	Beta	sr <sup>2</sup>
Self-eff	79.6	5.0	-.06	-.50*	.20
Age	55.5	16.0	-.022	-.19	.02
Cancer			-.007	-.001	.00
Expect			.04	.02	.00
Satisf			.06	.03	.00

Intercept = 11.19

R<sup>2</sup> = .25

Adjusted R<sup>2</sup> = .21

R = .49

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*Self-eff = self-efficacy*

*satisf = satisfaction*

\* *p* < .01

*Correlation coefficients are shown in Table 4.4*

## **CHAPTER 5**

### **DISCUSSION**

#### **5 - 1 Introduction**

The conceptual model used as the basis for this study depicts the relationship between preoperative factors which may influence postoperative pain. Each of the five independent variables was tested for its relationship with the dependant variable, postoperative pain and for any association which may be present with any of the other independent variables. No association was found between the subject's age, gender, satisfaction, expectation and postoperative pain. However, self-efficacy was found to be negatively correlated with pain indicating that the more an individual believes that they have the ability to influence and control outcomes (general and social self-efficacy), the less pain they will experience. Several of these variables such as age, gender and satisfaction, were also shown to be interrelated. Each of these relationships will be discussed under separate headings.

Examination of data relating to postoperative information demonstrated a wide variation in the type and amount of information given to subjects before their operation and a significant proportion of the subjects were not satisfied with the information they received.

## **5 - 2 Postoperative Pain and Self-efficacy**

As there are no reported studies which have tested this association in the postoperative area, the finding of a moderate association between general self-efficacy and pain score is of some significance. The negative nature of the correlation also supports the findings of other self-efficacy studies reported in the literature.

The predictive strength of self-efficacy as demonstrated in the regression analysis was not large with self-efficacy accounting for 22% of the variation in pain scores. These results are however, encouraging, and further studies are recommended to test self-efficacy with other hypothesized predictors such as anxiety in a attempt to improve the predictive power. If the accuracy of prediction can be improved and application made to preoperative nursing practice, patient outcomes such as postoperative pain control and recovery may be improved.

The use of a measure of general self-efficacy may have reduced the sensitivity of the score, and it is possible that the use of a situation specific tool may yield stronger correlational coefficients. While the use of a more specific tool may have been desirable, studies such as that by Langer (cited in Scott et al. 1983) show that emphasis on impending discomfort may sensitize patients or increase their anticipatory anxiety and so increase postoperative pain and that direct questioning about postoperative pain may be inappropriate.



### **5 - 3 Postoperative Pain and Age**

The fact that no significant relationship was demonstrated between these variables is not unexpected as there is mounting evidence in the literature to support this finding. The current study supports studies such as that carried out by Scott et al. (1983) which found no direct correlation between these two variables. The sample characteristics of the current study and that used by Scott et al. were similar, in that both used specific operation categories as a basis of sample selection. There was a difference however, in the age of the sample, the mean age of Scott's sample was 45 years as compared to the current study in which the mean age was 55 years.

### **5 - 4 Postoperative Pain and Gender**

As with the question of age, no significant association was found between postoperative pain and gender. The conflicting results reported in the literature with respect to age are also found when the relationship between gender and pain is examined. While there may be social influence on how nurses perceive males and females will respond to pain (Ogden & Burke, 1989), this study did not find any basis for the assumption that the perception and reporting of postoperative pain is different between males and females.

## **5 - 5 Postoperative Pain and Satisfaction with Preoperative Information**

The hypothesis of a significant correlation between postoperative pain and satisfaction was not supported. Although a correlation was noted, this failed to reach the required level of significance. The direction of the correlation was negative as predicted. This result is inconsistent with other studies ( Langer (cited in Scott et al.) 1983; Scott, et al., 1983; Thompson et al., 1990.) all of whom reported significant correlations between satisfaction with information and postoperative pain. While Thompson et al. used a significantly different sample from the present study ( all male, mean age = 53) Scott et al. used sample group comprising of one operation type (Cholecystectomy), similar to the sample in the present study, however, the mean age of this group ( $\underline{M}=45$ ) was lower.

It is possible that the results of this study were influenced by the age of the subjects as a positive association was demonstrated between age and satisfaction. The mean age of subjects in this study group (  $\underline{M}=55$  years ) differed from that of the Scott et al. study ( $\underline{M} = 45$ ) and it is possible that this difference could account for the conflicting result, once again a younger sample group may have given similar results to those of Scott et al.

Of concern is that 74% of the subjects reported that they did not receive any information regarding postoperative pain and it's management. This is a surprising result in light of the fact that all subjects used Patient Controlled Analgesia (PCA) as their only method of pain control. One of the basic requirements of successful use of PCA is the ability of the patient to utilise

the system effectively and this ability is achieved through preoperative assessments and education ( Ferrant, 1992; Oetker- Black et al., 1992; Owen et al., 1990; Shade, 1992). Based on the analysis of the recalled data which demonstrated the stability of the subjects' responses, there is no reason to doubt that the subjects' recall is accurate, and so there would seem to be serious shortcomings in the preoperative preparation of this subject group. Recognising the fact that the study area is a large busy hospital, dealing primarily with urgent cases, shortage of time between admission and theatre could be offered as one reason for this lack of information. However, 50% of the sample in this study were subjects who had undergone non-emergency surgery, that is , they were in the hospital at least twenty four hours prior to going to theatre, sufficient time for preoperative information to be given. Further, examination of data relating to this outcome showed that there was no significant difference in pain scores between these two groups.

The lack of a significant difference between the subjects' pain scores for those who had information and those who did not may be explained by the fact that only 9 subjects were given information by nurses or doctors. In addition to this small number, there is no indication as to the amount and nature of the information. The remaining 6 subjects had used information gained from previous surgery and the content and accuracy of this information may be suspect.

## **5 - 6 Relationship Between Age, Expectation and Satisfaction**

The weak association shown between age and both expectation of postoperative pain, and satisfaction with preoperative information may be seen as an effect coming from the age range of the sample. The subjects were, in many cases quite elderly. The positive nature of the association of these variables may reflect the fact that social conventions held by elderly people may not be as orientated toward medical consumerism as younger patients (Fine, 1988), Similarly, older patients may consider high pain levels an acceptable and expected side-effect of surgery (McCaffery & Ferrell, 1991). This acceptance of high pain levels and a general unquestioning acceptance of medical opinion may have resulted in this particular sample reporting high levels of satisfaction with what information they did receive. A younger sample group may have yielded different results. While the study reported by Scott et al. (1983) was conducted on a younger sample group, the relationship between these variables was not tested and so no comparison can be made.

## **5 - 7 Expectation and Experience of Postoperative Pain**

A significant proportion of the subjects (30%) reported experiencing more pain postoperatively than they had expected, however, the proportion of subjects reporting this incongruence is very much lower than that reported by Rees and Davis (1993) (67%) who used a similar sample group. With nature of the data available from this study and that gathered by Rees and

Davis, it is not possible to examine this difference as no information was gathered in either study about the exact nature of preoperative information or the prior pain experience of the subjects. Both these factors are thought to influence expectation of postoperative pain (Carr, 1990; Wallace, 1985).

### **5 - 8 Stability of Recalled Data**

Because of the nature of the sample it was necessary to collect data relating to expectation and pain score some days after the event, the examination of this data for stability of response was a significant proportion of the data analysis procedure. As a result of this examination it was shown that subjects do recall both preoperative and postoperative events accurately when asked about them after the operation. This technique is a promising one for other studies in which it may also be necessary or desirable to collect recall data, however.

### **5 - 9 Implications for Nursing**

Several findings of this study have implications for nursing practice. The finding on self-efficacy needs further investigation on diverse groups of subjects and in a variety of clinical areas before it can be applied to the clinical practice. In time however, this information may be used to develop a preoperative assessment tool which may aid nurses to identify patients who need special preoperative education and specific postoperative actions to maintain adequate pain control.

The results relating to satisfaction with preoperative information and the pain scores, as well as the amount of information received by patients may influence areas which use PCA as a method of pain control to consider the value and quality of their preoperative teaching and the procedures they use to select patients who will use this technique.

The large number of subjects who reported being dissatisfied with the general information they received should also be of concern to practitioners, and may indicate a need for changes in what information is given to patients and the method used to give that information.

It is of interest that despite the evidence of no association between age and postoperative pain, age is still included as a factor to be taken into consideration when assessing pain and there is at least some anecdotal evidence that some nurses are reluctant to administer analgesics aimed at complete pain relief for elderly patients even in the absence of clinical side effects. There is also evidence that some nursing actions are based on the assumption that elderly people do not experience as much pain (McCaffery & Ferrell, 1991; McCaffery & Hart, 1976). If, as this and other studies suggest, there is no basis for this discrimination, nursing care should be delivered accordingly.

## **5 - 10 Acceptability of Interview Format and Questions**

The format of the interview was generally well accepted by the subjects all of whom completed all questions on the self-efficacy questionnaire. There

were no refusals to answer any of the questions during the interview. When approached to take part in the study, most subjects were "pleased to help" and were only too happy to discuss their pain experience with someone who showed an interest in what they had to say. Only one subject refused to take part in the study and the reason given was that she was simply tired of answering questions.

### **5 - 11 Limitations of the Study**

The following limitations should be considered when examining the results of this study:

1. The conclusions should be limited to those patients who have undergone abdominal surgery and have been under the care of a specialist unit such as the Acute Pain Service.
2. The study was conducted in one centre only and so may have limited application in other settings.

### **5 - 12 Further Research**

It is recommended that several of the findings of this be subjected to further research. A larger sample size would allow the inclusion of different operation groups, younger subjects and different types of pain control. The inclusion of these groups may clarify some of the associations found, for instance that between age and satisfaction.

In order to improve the accuracy of prediction of postoperative pain, the study of self-efficacy together with other predictors identified in the literature, such as preoperative anxiety may prove very rewarding.

The important area of preoperative information should be re-examined using the experimental design of a control and study groups in an attempt to identify the nature of information given and its effect on both the experience of postoperative pain and the effective use of PCA as a method of pain control.



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**APPENDICES I - V**

## **APPENDIX I: ACUTE PAIN SERVICE**

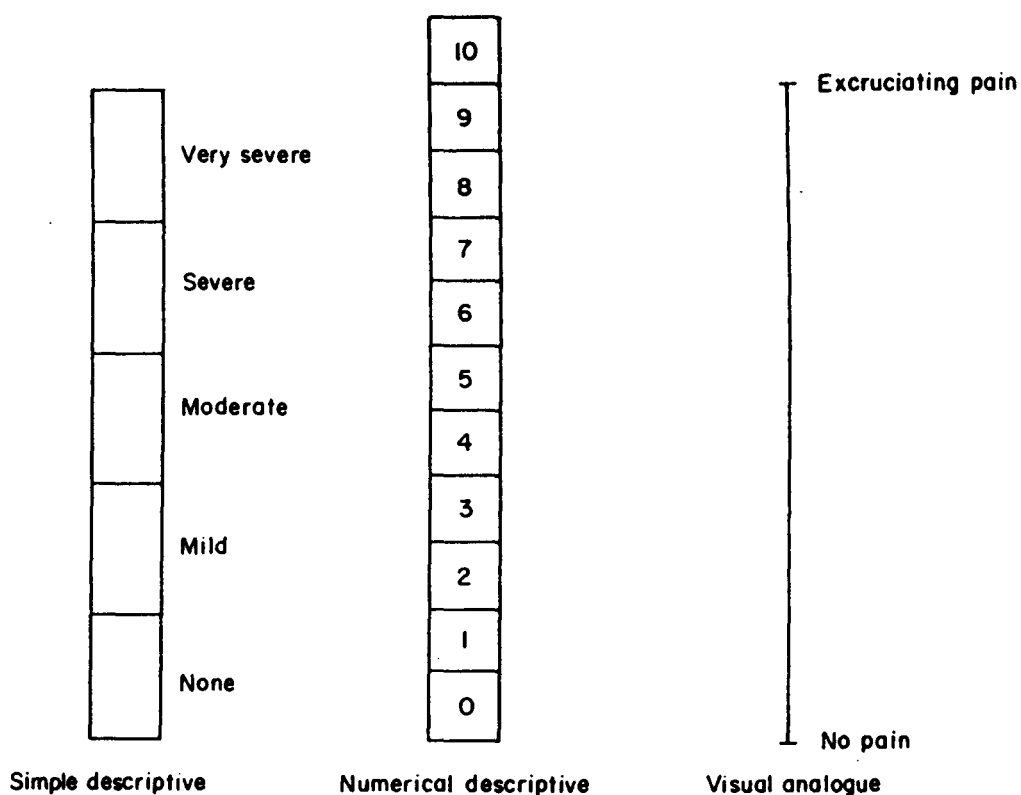
An Acute Pain Service (APS) was established at Royal Perth Hospital in 1990 with the objective of acquainting staff with up-to-date techniques for acute pain control and providing a pain control service to patients who are suffering acute pain. The service provides service on a referral basis and a large proportion of surgical patients are referred to the service by their anaesthetist. The team also provide consultative services when problems arise in pain management of individual patients. This specialist team of anaesthetic consultants and registrars, and one full-time registered nurse, provides 24 hour consultation to nursing and medical staff. Three team members visit patients referred to the service twice a day, during which time the most appropriate management of each patient's acute pain is discussed with both the patient and his/her attending nurse. Particular regard is paid to the quality of the patient's analgesia and the presence of undesired side effects and complication. The APS encourages nurses to take responsibility for making decisions about the amount of opioid administered in accordance with their assessment of the patient's pain and within protocols set by the APS.

(Rees & Davis, 1993)



## APPENDIX II: NUMERICAL RATING SCALE FOR THE ASSESSMENT OF PAIN

Carr, E.C.J. (1990). Postoperative pain: patient's expectations and experiences. *Journal of Advanced Nursing*, 12, 593-604.



The three pain rating scales in common use.

The current study used pain scores collected using the NUMERICAL DESCRIPTIVE SCALE.

## **APPENDIX III: POSTOPERATIVE INTERVIEW**

### **Interviewer's Guide**

" Think back to the day before your operation, tell me how you felt at that time about the following";

**Q1 - How much pain did you expect to have after your operation?**

1. no pain
2. mild pain
3. moderate pain
4. severe pain
5. unbearable pain

"Now think back to the first day after your operation",

**Q2 - Which of the following best describes the amount of pain you experienced the first day after your operation?**

1. no pain
2. mild pain
3. moderate pain
4. severe pain
5. unbearable pain

"Using the same rating scale as you used to let the nurses know how much pain you had (show scale)"

Q3 - How would you rate the pain you experienced on the first day after your operation?

---

Q4 - Where did you get information about how much pain to expect after your operation?

1. personal experience from previous operations
2. family
3. friends
4. doctor
5. nurse
6. did not get any information
7. other \_\_\_\_\_

"Now I would like to ask you about the information you received before your operation about what to expect during your time in hospital. Think of all the information you received. At the time..."

Q5 - Did you feel satisfied with the information given to you?.

1. not satisfied
2. somewhat satisfied
3. satisfied
4. very satisfied

If 3 or 4 go to Q6 If 1 or 2 go to Q7

Q6 - Did the information you were given make you feel?

1. not worried
2. somewhat worried
3. no change
4. worried
5. very worried

Q7 - If you were not satisfied with the information, why not?

---

---

Q8 - Where did you get the information about your operation and what to expect afterwards?

1. have an operation before
2. family
3. friends
4. doctor
5. nurse
6. did not get any information
7. other \_\_\_\_\_

"Knowing what you do now...."

Q9 - How useful was the information you were given?

1. not useful
2. somewhat useful
3. useful
4. very useful

## **Subjects' Reference Sheet**

**Q1 - How much pain did you expect to have after your operation?**

1. no pain
2. mild pain
3. moderate pain
4. severe pain
5. unbearable pain

**Q2 - How does the pain you experienced compare with the amount of pain you expected to experience?**

1. much less
2. a little less
3. about the same
4. a little more
5. much more

**Q3 - How would you rate the pain you experienced on the first day after your operation?**

---

**Q4 - Where did you get information about how much pain to expect after your operation?**

1. personal experience from previous operations
2. family

3. friends
4. doctor
5. nurse
6. did not get any information
7. other \_\_\_\_\_

**Q5 - Did you feel satisfied with the information given to you?.**

1. not satisfied
2. somewhat satisfied
3. satisfied
4. very satisfied

**If 3 or 4 go to Q6 If 1 or 2 go to Q7**

**Q6 - Did the information you were given make you feel?**

1. not worried
2. somewhat worried
3. no change
4. worried
5. very worried

**Q7 - If you were not satisfied with the information, why not?**

---

---

**Q8 - Where did you get the information about your operation with regard to what to expect afterwards?**

1. had an operation before
2. family
3. friends
4. doctor
5. nurse
6. did not get any information
7. other \_\_\_\_\_

**Q9 - How useful was the information you were given?**

1. not useful
2. somewhat useful
3. useful
4. very useful



## APPENDIX IV: SELF-EFFICACY MEASUREMENT TOOL

(Sherer et al., 1982)

**Instructions**

This questionnaire is a series of statements about your personal attitudes and traits. Each statement represents a commonly held belief. Read each statement and decide to what extent it describes you. There are no right or wrong answers. You will probably agree with some of the statement and disagree with others.

Please indicate your own personal feelings about each statement below by marking the letter that best describes your attitude or feeling. Please be very truthful and describe yourself as you really are not as you would like to be.

	Disagree Strongly	Disagree Moder- ately	Neither agree nor disagree	Agree Moder- ately	Agree Strongly
1 I like to grow house plants	A	B	C	D	E
2 When I make plans I am certain I can make them work	A	B	C	D	E
3 One of my problems is that I cannot get down to work when I should	A	B	C	D	E
4 If I cannot do a job the first time, I keep trying until I can	A	B	C	D	E
5 Heredity plays the major role in determining one's personality	A	B	C	D	E
6 It is difficult for me to make new friends	A	B	C	D	E
7 When I set important goals for myself, I rarely achieve them	A	B	C	D	E
8 I give up on things before completing them	A	B	C	D	E
9 I like to cook	A	B	C	D	E
10 If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me	A	B	C	D	E
11 I avoid facing difficulties	A	B	C	D	E
12 If something looks too complicated, I will not even bother to try	A	B	C	D	E
13 There is some good in everybody	A	B	C	D	E
14 If I meet someone interesting who is very hard to make friends with, I will soon stop trying to make friends with that person	A	B	C	D	E
15 When I have something unpleasant to do, I stick to it until I finish	A	B	C	D	E
16 When I decide to do something, I go right to work on it	A	B	C	D	E
17 I like science	A	B	C	D	E

	Disagree Strongly	Disagree Moder- ately	Neither agree nor disagree	Agree Moder- ately	Agree Strongly
18 When trying to learn something new, I soon give up if I am not initially successful	A	B	C	D	E
19 When I am trying to become friends with someone who seems uninterested at first, I don't give up very easily	A	B	C	D	E
20 When unexpected problems occur, I don't handle them well	A	B	C	D	E
21 If I were an artist, I would like to draw children	A	B	C	D	E
22 I avoid trying to learn new things when they look too difficult for me	A	B	C	D	E
23 Failure just makes me try harder	A	B	C	D	E
24 I do not handle myself well in social gatherings	A	B	C	D	E
25 I very much like to ride horses	A	B	C	D	E
26 I feel insecure about my ability to do things	A	B	C	D	E
27 I am a self-reliant person	A	B	C	D	E
28 I have acquired my friends through my personal abilities at making friends	A	B	C	D	E
29 I give up easily	A	B	C	D	E
30 I do not seem capable of dealing with most problems that come up in my life	A	B	C	D	E

## Self-efficacy Scoring Code

(Sherer et al., 1982)

### Code and Direction Key

<i>Item</i>	<i>*Dir Key</i>	<i>Item</i>	<i>*Dir Key</i>
2	0	18	1
3	1	19	0
6	1	20	1
7	1	22	1
8	1	23	0
10	0	24	1
11	1	26	1
12	1	27	0
14	1	28	0
15	0	29	1
16	0	30	1

Letter answers recorded on the subjects' data sheet are converted to numbers for the purpose of creating a score. Some items are fillers and so are not scored.

0 = Not reversed A=1, B=2, C=3, D=4, E=5  
 1 = Reversed A=5, B=4, C=3, D=2, E= 1

## APPENDIX V: INFORMED CONSENT and PATIENT INFORMATION FORM

### Informed Consent

PROJECT TITLE: Preoperative Predictors of Postoperative  
Pain

---

You are invited to take part in a research project that I am undertaking as part of my studies for a Master of Health Science (Nursing) at Edith Cowan University. The study will look at how much pain patients expect to have after their operation and how this affects the amount of pain they experience. I will also be investigating how satisfied patients are with the information they received before their operation and whether there is any connection between this and how much pain they experience.

Where access to a patient's medical records is necessary for the successful completion of the project, the patient's permission will be sought.

While the study will not have any direct benefit to yourself, it is hoped that the results can be used in the future to improve nursing care.

I will be asking you some questions about how much pain you expected, how much pain you had and how satisfied you were with the information you were given about your operation and hospital stay. These questions will take 15-30 minutes of your time to answer.

Any information gathered is strictly confidential and will only be used by myself for the purpose of the study. Information which could identify any particular person will be destroyed at the completion of the study.

The study will have no ill effects on you and if you decided not to take part, this will in no way influence the care you receive. You are free to withdraw from the study at any time.

If you have any questions you may contact me at any time, both now and in the future by phoning 3451680.

Thank you for your consideration,

Robyn Paterson

THIS IS TO CERTIFY THAT I \_\_\_\_\_ (print name)

agrees to participate as a volunteer in the above project.

I have read and/or had explained to me the information above and any questions I have asked have been answered to my satisfaction. I understand that I may withdraw from the study at any time and that information I give is confidential and that provided I am in no way identified, the information gathered may be published.

\_\_\_\_\_  
Participant (date) \_\_\_\_\_ Researcher (date)

## **Patient Information Form**

**PROJECT TITLE: Preoperative Predictors of Postoperative Pain**

---

You are invited to take part in a research project that I am undertaking as part of my studies for a Master of Health Science (Nursing) at Edith Cowan University. The study will look at how much pain patients expect to have after their operation and how this effects the amount of pain they experience. I will also be investigating how satisfied patients are with the information they received before their operation and whether there is any connection between this and how much pain they experience. While the study will not have any direct benefit to yourself, it is hoped that the results can be used in the future to improve nursing care.

I will be asking you some questions about how much pain you expected, how much pain you had and how satisfied you were with the information you were given about your operation and hospital stay. These questions will take 15-30 minutes of your time to answer.

Any information gathered is strictly confidential and will only be used by myself for the purpose of the study. Information which could identify any particular person will be destroyed at the completion of the study.

The study will have no ill effects on you and if you decided not to take part, this will in no way influence the care you receive. You are free to withdraw from the study at any time.

This study has been approved by the Ethics Committee of Royal Perth Hospital and any concerns you may have about the project can be directed to Dr. J.M. White, Chairperson, Ethics Committee, c/- Medical Administration, Royal Perth Hospital, Wellington Street, Perth WA 6001.

If you have any questions you may contact me at any time, both now and in the future by phoning 3451680.

Thank you for your consideration,

Robyn Paterson