NURSES’ INTENTIONS TO ADMINISTER MORPHINE 
FOR POST-OPERATIVE PAIN: 
AN APPLICATION OF AJZEN’S 
THEORY OF PLANNED BEHAVIOUR 

A Dissertation Submitted to the 
College of Graduate Studies and Research 
in Partial Fulfilment of the Requirements 
for the Degree of Doctor of Philosophy in the 
Department of Psychology 
University of Saskatchewan 
Saskatoon, Saskatchewan 

by 
Douglas W. Jurgens 
Fall 1996 

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0-612-24026-6
UNIVERSITY OF SASKATCHEWAN

College of Graduate Studies and Research

SUMMARY OF DISSERTATION

Submitted in partial fulfilment

of the requirements for the

DEGREE OF DOCTOR OF PHILOSOPHY

by

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Abstract

The present study was designed to investigate cognitive predictors of nurses’ decisions to administer morphine for pain post-operatively using the Theory of Planned Behaviour (Ajzen, 1985; 1991). Hypotheses derived from the theory were that theoretical determinants of behavioural intention (attitude toward the behaviour, the subjective norm and perceived behavioural control) should combine to predict intention. Beliefs about the likelihood that certain events would occur that might prevent performance of the behaviour and the rated importance of these events were hypothesized to combine multiplicatively in the prediction of perceived behavioural control and were hypothesized to correlate more weakly with intentions than attitudes. Finally, scores on the Pain Beliefs Questionnaire (Jurgens, 1995) were hypothesized to have only indirect effects on behavioural intention mediated by constructs considered more proximal to behavioural intention in the Theory of Planned Behaviour.

A preliminary study determined relevant control beliefs which were examined for their utility in predicting perceived behavioural control in the main study. The preliminary study also piloted the vignette for plausibility, clarity, comprehensiveness and accuracy.

One hundred forty-nine registered nurses employed at fourteen general hospitals in Saskatchewan and involved in the care of patients who experience pain constituted the sample in
the main study. Subjects responded to questions with regard to a
vignette which described a post-operative patient in pain. Nurse
subjects completed scales assessing the independent and dependent
variables with regard to performing two behaviours; (a)
administering the highest narcotic dosage allowed for by the
prescription order, and (b) administering the next dose of
narcotic analgesia in the shortest interval allowed for by the
prescription order. Ratings with regard to each of the two
behaviours were combined to derive variable scores for the
behavioural category of nurses’ administration of morphine for
pain post-operatively.

Results provided strong support for the application of the
Theory of Planned Behaviour to the behaviours involved in the
administration of morphine for pain post-operatively. Attitude
toward the behaviour, and perceived behavioural control emerged
as the significant predictors of behavioural intention, with
attitude toward the behaviour accounting for the most variance.
No evidence for any of the interactions proposed by Ajzen (1985)
was found. Evidence for mediation of distal model components by
more proximal components was found. Implications for Ajzen’s
theory as well as applied implications and limitations of the
current research are discussed.
Acknowledgements

A large number of people contributed their time, energy and patience toward helping me complete this dissertation. First among these are my wife, Janis, and my children, Nigel, Jade and Tasha. My family has sacrificed as much as I have in this process and, for this, I will always be grateful. I would also like to thank my parents for their faith in me and for the many ways in which they have supported me throughout my academic career.

I would like to thank my supervisor, Dr. Carl von Baeyer for his endless patience with me and his constant willingness to help in any way he could. I am also grateful for the efforts of my committee in providing helpful and constructive critiques of my work throughout this process. Thanks in this regard go to Dr. Bob Zemore, Dr. Louise Alexitch and Dr. Gail Remus. I would also like to thank committee members who were, for various reasons, unable to remain with this project to its completion. These people are Dr. Myles Genest, Dr. Marvin Brown and Dr. Stella Dyck. Finally, I wish to thank my external examiner, Dr. Michael Thomas from the University of Winnipeg for participating in my oral defense.

I must also thank my employer, the Prince Albert Health District and my Director, Mr. Frank Regel. Mr. Regel has made every conceivable effort to facilitate completion of this work and has made numerous allowances for me as I struggled to finish my dissertation while employed full-time. I must also thank my
colleagues at the Prince Albert Mental Health Centre for tolerating my occasional absences and accepting extra responsibilities to help me finish. I would particularly like to thank Al Adams and Della Hunter in this regard. Finally, I must express particular thanks to the Director of Patient Care Services with the Prince Albert Health District, Cecile Hunt. Cecile has consistently shown interest in my research and has contributed significantly towards the completion of my research by providing feedback at numerous points in the process.

Finally, I would like to express gratitude to the nursing staffs and Nursing Unit Managers across Saskatchewan for accommodating my requests for access to nurse subjects. I must particularly thank the former Director of Patient Care Services with the Regina Health District, Debbie Juarez. Ms. Juarez committed to helping with my research from an early stage and offered more help to me than I ever could have expected. I would also like to recognize the hospitals in which this research was conducted: City Hospital (Saskatoon), Royal University Hospital (Saskatoon), St. Paul’s Hospital (Saskatoon), Regina General Hospital, Plains Hospital (Regina), Pasqua Hospital (Regina), Melfort Union Hospital, Moose Jaw Hospital, Battlefords Union Hospital, St. Elizabeth Hospital (Humboldt), Yorkton Hospital, Swift Current Regional Hospital, Nipawin Hospital and Victoria Hospital (Prince Albert).
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NURSES’ INTENTIONS TO ADMINISTER MORPHINE FOR
POST-OPERATIVE PAIN: AN APPLICATION OF
AJZEN’S THEORY OF PLANNED BEHAVIOUR

Introduction

The analgesic administration practices of nurses have received considerable attention in nursing research literature (Ferrell, Eberts, McCaffery & Grant, 1991; Hunt, 1992; Koh & Thomas, 1994; Zalon, 1995). This interest derives, at least in part, from the work of Marks and Sachar (1973) and others (Cohen, 1980; Donovan & Dillon, 1987; Donovan, Dillon & McGuire, 1987; Keerisztanto & Heaman, 1972; Knight & Metha, 1978; Melzack, Abbott, Zackon, Mulder & Davis, 1987) who have documented the occurrence of moderate to severe pain in a variety of patient populations. Specifically, Marks and Sachar (1973) and others (Cohen, 1980; Keerisztanto & Heaman, 1972; Knight & Metha, 1978; Mather & Mackie, 1983; Melzack, Abbott, Zackon, Mulder & Davis, 1987) have shown that a significant proportion of adult post-operative patients are undermedicated for pain. Marks and Sachar (1973) demonstrated that fully 73% of their sample of post-operative patients experienced post-operative pain that was moderate or severe. Mather and Mackie (1983) found evidence suggesting that children are also undermedicated post-operatively. According to Charap (1978), cancer patients often suffer unnecessarily as a result of inadequate administration of narcotic analgesic medication. In a more recent study of cancer pain, Dorrepaal, Aaronson and Frits (1989) found that 55% of cancer patients reported pain which severely limited activities
and sleep.

Cleeland, Cleeland, Reuvan and Rinehardt (1986) and Foley (1979) have argued that the vast majority of patients should experience virtually no pain or that any pain they experience should not be rated as distressing. In a 1972 study by Keeri-Szanto and Heaman, the use of an analgesic pump controlled by the patient resulted in virtually complete pain relief for their sample. The analgesic pump group in this study did not receive a traditional analgesic prescription and, rather, self-administered their analgesia based on their level of perceived pain. Interestingly, only five (of 60) patients self-administered higher analgesic dosages than would otherwise have been available. In the control group who received a traditional analgesic prescription, one out of five patients experienced significant pain. Despite the long-established effectiveness of patient-controlled analgesia (PCA), it has been slow to come into routine use. Indeed, PCA is likely to be used with greater frequency and effectiveness in future (Nolan & Wilson; 1995). Given the results of the Keeri-Szanto and Heaman (1972) study, it is somewhat surprising that use of PCA is not more common today.

Given that modern pain management techniques and narcotic medications are very effective in eliminating pain for the majority of patients, one is left to wonder why many patients continue to suffer what Melzack (1990) characterized as "needless pain". One important factor is, certainly, the prescribing
practices of physicians. If the analgesic prescription is inadequate, the patient will experience pain until the prescription is changed. That said, however, in those cases where the prescription is adequate but the patient receives less than the allowed amount of analgesia over time and experiences pain which might have been controlled, the analgesic administration practices of nurses have a role to play in the problem of unmedicated pain. Despite considerable concern in the medical community resulting from the research of Marks and Sachar (1973) and others, no investigation into the specific predictors of nurses’ pain management practices has been conducted.

The current research proposal investigated the utility of the Theory of Planned Behaviour (Ajzen, 1991) to predict the intention to administer morphine for pain post-operatively. The Theory of Planned Behaviour (Ajzen, 1991) has been demonstrated to be useful in the prediction of behaviours in many contexts, including nurses’ documentation behaviour in pain management (Nash, Edwards, & Nebauer, 1993). This literature will be reviewed later.

The current research added to the knowledge gained by Nash, Edwards and Nebauer (1993) by focussing on nurses’ pain management decisions, as opposed to their documentation behaviours. This research incorporated the Pain Beliefs Questionnaire (Jurgens, 1995), a 22-item inventory of general beliefs about pain derived from the work of McCaffery (1979) who
suggested that nurses’ adherence to "myths" about pain and its
management would be an important predictor of their pain
management decisions and, ultimately, of the amount of pain
experienced by patients. The Pain Beliefs Questionnaire was
piloted in previous research conducted by the author (Jurgens,
1995). Appendix I contains a report of this previous research
(Study A). The current research also assessed the relative power
of general pain beliefs as assessed by the Pain Beliefs
Questionnaire as compared to elements of Theory of Planned
Behaviour which were postulated to have a stronger relationship
to the intention than more general beliefs, that is, general
beliefs about pain.

The Theory of Planned Behaviour and
Nurses’ Pain Management Decisions

Overview of the Theory.

The Theory of Planned Behaviour (Ajzen, 1985; 1991) is an
extension of Azjen and Fishbein’s (1980) Theory of Reasoned
Action (see also Fishbein & Azjen, 1975). Whereas the Theory of
Reasoned Action was designed to predict volitional behaviour and
its psychological determinants, the Theory of Planned Behaviour
was designed to predict those behaviours which are not under
complete volitional control (Ajzen, 1991). The Theory of
Reasoned Action proposes that the intention to perform a specific
behaviour is predicted by the attitude towards the specific
behaviour (one’s general feeling of favourableness or
unfavourableness toward performing the behaviour) and the subjective norm (the perceived favourableness of important others towards performing the behaviour). In order to predict behaviour which is not completely under volitional control, Ajzen (1987) proposed the addition of a third variable to the model, perceived behavioural control, to predict the behavioural intention. Perceived behavioural control is defined as "the perceived ease or difficulty of performing the behaviour under consideration" (p. 44). Ajzen (1991) argues that the degree of perceived control experienced by the respondent in his/her performance of the behaviour makes an independent contribution to the prediction of the behavioural intention over and above that contributed by the subjective norm and the attitude towards the behaviour. Ajzen (1991) further proposes a direct link between perceived behavioural control and performance of the behaviour.

Ajzen (1991) has acknowledged similarities between his construct of perceived behavioural control and other constructs in the social-psychological literature. Specifically, Ajzen has noted similarities with Rotter's (1966) perceived locus of control, Atkinson's (1964) expectancy of success in his theory of achievement motivation and Bandura's (1977) perceived self-efficacy. He draws distinctions between perceived behavioural control and Rotter's locus of control in terms of specificity, arguing that locus of control is a generalized tendency whereas perceived behavioural control is specific to a given behaviour. With regard to Atkinson's expectancy of success, Ajzen (1991)
argues that expectancy of success is combined multiplicatively with generalized achievement motivation, making the product of these a nonspecific construct. This contrasts with constructs in the Theory of Planned Behaviour which are, by definition, specific in terms of action, target, context and time period involved and are consistent across the assessment of constructs within the theory.

Ajzen (1991) has suggested that perceived behavioural control is most like Bandura's concept of self-efficacy. Self-efficacy has been demonstrated to be important in a study of overcoming phobias (Bandura, Adams & Beyer, 1977). The extent to which subjects believed they could overcome a simple phobia was predictive of their ultimate success in doing so through behavioural psychotherapy. Ajzen (1991) notes, however, that an important distinction between perceived behavioural control and self-efficacy lies in the placement of perceived behavioural control in a larger context of beliefs and attitudes which predict intentions, namely, the Theory of Planned Behaviour.

In their 1995 study, Terry and O'Leary suggest that operationalization of perceived behavioural control by Ajzen has been unclear. Specifically, they argue that perceived behavioural control and self-efficacy have been confounded in the past and treated as one variable. In their study, Terry and O'Leary (1995) assessed and analyzed perceived behavioural control and self-efficacy separately. Factor analytic results indicated that self-efficacy and perceived behavioural control
items loaded on separate factors. Further, they were found to have different predictive effects. Perceived behavioural control was found to have a direct effect on behaviour while self-efficacy was found to have a direct effect on intention. The results of this study, then, point to the possibility of further refinement of the components of the Theory of Planned Behaviour.

In his initial presentation of the Theory of Planned Behaviour, Ajzen (1985) argued for measurement of model components with regard to performance of the specific behaviour as well as with regard to "trying" to perform the specific behaviour. Essentially, Ajzen (1985) hypothesized that perceived behavioural control would interact with intention such that as attitude toward the behaviour and subjective norm increased under conditions of high control, the behavioural intention would increase. However, under conditions of low control, behavioural intention would not increase as a function of attitude toward the behaviour and subjective norm. Subsequent investigations (Ajzen & Madden, 1986; Schifter & Ajzen, 1985) found no evidence for this interaction. In his 1991 presentation of the Theory of Planned Behaviour, Ajzen deleted hypotheses regarding this interaction from the model.

The independent contribution of the degree of perceived control in the prediction of the behavioural intention has been demonstrated by Schifter and Ajzen (1985). In their study of the cognitive predictors of weight loss, the authors demonstrated independent contributions in the prediction of intention by all
three of the immediate determinants: attitude towards the behaviour, subjective norm and perceived behavioural control. As well, a direct link between degree of perceived control and performance of the behaviour, that is, loss of weight, was demonstrated by the authors. The correlations of the other two determinants, attitude towards the behaviour and subjective norm, with performance of the behaviour were nonsignificant.

In a study investigating the utility of the Theory of Planned Behaviour in the prediction of nurses' intention to perform pain assessment, Nash et al. (1993) found that the combination of attitude toward the behaviour, subjective norm and perceived control accounted for a significant proportion of variance in the prediction of the behavioural intention. A pilot study was conducted in which nurse subjects indicated the advantages and disadvantages of pain assessment as well as the identity of those people most likely to influence their decisions regarding pain assessment. The three most commonly occurring responses regarding advantages and disadvantages were used in the main study to compute the attitude toward the behaviour measure. Similarly, the three most commonly occurring referents were used in the main study to compute the subjective norm. Beliefs hypothesized to predict perceived control were not assessed in this study.

In the main study Nash et al. (1993) obtained completed questionnaires assessing a subset of all the constructs of the Theory of Planned Behaviour from 59 of 100 potential nurse
subjects. Attitude toward the behaviour and the subjective norm were assessed in terms of their theoretical determinants while perceived control was assessed directly. The analysis demonstrated that only perceived control made an independent contribution to the prediction of the behavioural intention. That is, the theoretical determinants of neither attitude toward the behaviour nor subjective norm made significant independent contributions to the prediction of the behavioural intention over and above that contributed by the other two immediate predictors of intention. An obvious criticism of this methodology is that the different levels at which the constructs were assessed makes comparisons of them suspect. That is, the attitude toward the behaviour and the subjective norm were assessed at a level more distal to intention than was perceived control. Correlations between behavioural intention and "distal" constructs should be smaller than those between behavioural intention and more "proximal" constructs (Ajzen, 1985, 1991). This criticism of the Nash et al. (1993) study will be returned to later.

The Theory of Planned Behaviour assumes that most people are able to consider the outcomes of their actions and are able to describe cognitive processes involved in their decision-making before or after engaging in the behaviour. In general, people are characterized in the model as rational in their voluntary decision-making. Certain cognitions are hypothesized by Ajzen (1991) as being the best, or temporally closest, predictors of behaviour.
**Model variables.** Since the theory deals with behaviour which is not completely under volitional control, Ajzen (1991) notes that the individual’s behaviour may be predicted by his/her intention to perform the behaviour (i.e., by asking the individual if he/she intends to perform the behaviour) and by the amount of control the individual has over the performance of the behaviour. Perceived behavioural control is also hypothesized to have an indirect effect on performance of the behaviour through its effects, along with the attitude towards the behaviour and the subjective norm, on the behavioural intention.

Intention, then, is one of two immediate determinants of behaviour in the Theory of Planned Behaviour. In order to understand behaviour, however, the determinants of intention must be specified.

Intentions, in Ajzen’s (1991) Theory of Planned Behaviour, are determined by three constructs: attitude toward the behaviour, subjective norm and perceived behavioural control. Attitude towards the behaviour and subjective norm are defined in the Theory of Planned Behaviour as they were in the Theory of Reasoned Action (Ajzen & Fishbein, 1980). An individual’s attitude toward a behaviour is defined as "a person’s general feeling of favourableness or unfavourableness for that [behaviour]" (Ajzen & Fishbein, 1980, p. 54). An individual’s subjective norm is defined by Ajzen and Fishbein (1980) as the perceived social pressure to perform or not to perform a given behaviour. Perceived behavioural control is defined by Ajzen
(1991) as "the extent that a person has the required opportunities and resources [for the performance of the behaviour]" (p. 182).

In order to further explain how intentions are formed, the determinants of attitude, subjective norm and perceived behavioural control must be specified. Each of these constructs have two immediate determinants. The two immediate determinants of the attitude towards the behaviour are beliefs regarding the perceived certainty of the occurrence of the outcome and the evaluation of these outcomes. That is, Ajzen and Fishbein (1980) argue that individuals predict the outcomes of particular actions with varying degrees of certainty and evaluate these possible outcomes as positive or negative. As a simple example, a nurse may believe that there are two possible outcomes of administering the maximum analgesic dosage allowed by the prescription order as often as the prescription order allows: that the patient will be pain free and/or that the patient will become addicted to the medication. According to the Theory of Reasoned Action (Ajzen & Fishbein, 1980) this nurse will evaluate each outcome as positive or negative and will have an opinion regarding the certainty of each outcome's occurrence. There must be correspondent behavioural specificity among these constructs. That is, the level of behavioural specificity must be correspondent in terms of the action, target, context and time period involved, across the measurement of all constructs within the theory. Theoretically, the product of the evaluation of outcomes and the
perceived certainty of the outcome's occurrence yields the determinant of attitude toward the behaviour.

The subjective norm component is likewise determined by two constructs: the normative belief of important others and the motivation to comply with these important others. Normative beliefs involve the perceived beliefs of specific important others rather than the generalized important other as is the case with the subjective norm. Motivation to comply with these specific referents is combined with the person's belief that important others think he/she should or should not perform the behaviour to yield the determinant of the subjective norm component of the Theory of Planned Behaviour.

Similarly, perceived behavioural control is predicted by control beliefs (Ajzen, 1991). Control beliefs have been defined as the likelihood that certain barriers to performing the behaviour will interfere with or facilitate the performance of the behaviour (Ajzen & Madden, 1986). However, methods for assessing the theoretical determinants of perceived behavioural control have not been as clearly specified as those for assessing the determinants of attitude towards the behaviour and the subjective norm (Valois, Desharnais, Godin, Perron & Lecomte, 1993). Ajzen and Madden (1986) propose that the sum of ratings of the likelihood that certain barriers to performing the behaviour will interfere with its performance might be used as the determinant of perceived behavioural control. Ajzen (1991) has suggested that the product of the valence associated with
each control factor, that is, as inhibiting or facilitating performance of the behaviour, and the perceived importance of the control factor in facilitating or inhibiting performance might provide an assessment of the determinants of perceived behavioural control.

External variables. The Theory of Planned Behaviour (Ajzen, 1991) argues that "broad attitudes and personality traits have an impact on specific behaviours only indirectly by influencing some of the factors that are more closely linked to the behaviour in question" (p. 181). This position is identical to that adopted by Ajzen and Fishbein (1980) in the Theory of Reasoned Action. Ajzen and Fishbein’s (1980) Theory of Reasoned Action has characterized a number of types of variables commonly investigated in relation to behaviour as "external" to their theory. Among these types of variables are personality traits, broad attitudes and demographic variables. Although in many research projects, these variables are hypothesized to have strong and direct effects on behaviour, Ajzen and Fishbein (1980) argue that the effects of such variables are indirect and are mediated by the variables specified above. That is, a personality trait such as "extraversion" would be associated with the holding of certain beliefs about behaving in social contexts. However, it would be the specific beliefs themselves which would be related to specific instances of behaviour, rather than the general trait, often consisting of inconsistent or contradictory ideas and beliefs, of "extraversion". This hypothesis is
interesting in that it has the potential to explain the disappointing correlations between general traits and behaviour as well as the tendency for such correlations to demonstrate instability over time. Ajzen and Fishbein (1980) would argue that this is due to the failure to consider relevant cognitive mediators between the general trait and the behaviour in question.

A study by Ajzen and Timko (1986) investigating the relationship between health attitudes and behaviours demonstrated that attitudes assessed generally largely failed to correlate significantly with specific health behaviours. However, the average correlation between specific attitudes assessed according to the specifics of the Theory of Planned Behaviour and specific health behaviours was high ($r = 0.77$).

While not specifically stated in the literature, the statement by Ajzen (1991) that broad attitudes and personality traits have only indirect effects, mediated by specific beliefs and attitudes, on intentions and behaviour suggests that these components may be characterized as "external variables" in the same way as they are in the Theory of Reasoned Action.

In summary, Ajzen’s (1991) Theory of Planned Behaviour provides a comprehensive model of voluntary behaviour. The theory suggests that to understand, predict or change a behaviour, it should be traced back to the attitudes and beliefs which formed the individual’s intention to perform the behaviour in question. Figure 1 presents the model and its components.
Figure 1


Note: The relative weights of the determinants of intention can be determined by using multiple regression analyses (not illustrated).
**Rationale and Objectives.**

Ajzen (1991) has characterized the Theory of Planned Behaviour as an extension of the Theory of Reasoned Action designed specifically to predict behaviour which is not under complete volitional control. Indeed, research has demonstrated highly significant prediction of intention from attitude toward the behaviour, subjective norm and perceived behavioural control as well as significant independent contributions to the prediction of intention from these three model components. Significant multiple R values as well as significant regression coefficients associated with each of the three immediate predictors of the behavioural intention have been demonstrated in studies of intentions to play video games (Doll & Ajzen, 1992), exercising after childbirth (Godin, Valois & Lepage, 1993), attending university classes (Ajzen & Madden, 1986), donating blood (Giles & Cairns, 1995), exercise behaviour (Blue, 1995), smoking behaviour (Godin, Valois, Lepage & Desharnais, 1992), use of child restraint devices while driving (Richard, Dedobbeleer, Champagne & Potrin, 1994) and losing weight (Schifter & Ajzen, 1985). The Theory of Planned Behaviour, then, might be similarly useful in predicting nurses' analgesic administration behaviour. The Theory of Planned Behaviour is preferred over the Theory of Reasoned Action as regards nurses' analgesic administration behaviour due to the hypothesized lack of complete behavioural control in the performance of specific analgesic administration behaviours. This is due to the fact that the
nurse does not control the prescription written for a patient and that the patient may choose to refuse the offered analgesia, among other factors. The Theory of Planned Behaviour is also considered appropriate in this research as nurses are expected to be able to verbalize the cognitive processes specified above which lead to the intention to medicate a patient for pain.

Specific objectives to be achieved through the utilization of the Theory of Planned Behaviour (Ajzen, 1991) are: (a) to specify important cognitive processes engaged in by nurses involved in pain management, (b) to determine the relative power of general pain beliefs as compared to specific attitudes regarding analgesic administration behaviour in predicting nurses’ intention to manage pain in a patient in a particular fashion, (c) to allow for further theoretical conceptualization of the Pain Beliefs Questionnaire, (d) to investigate the form of relationships between constructs in the Theory of Planned Behaviour. The specificity of operational definitions of the constructs within the Theory of Planned Behaviour facilitated the accomplishment of the third objective.

Measurement of Model Components.

In research employing the Theory of Planned Behaviour, it is common that only a subset of the model’s components, related to the specific hypotheses of the research question, be measured. This is due to the impracticality of measuring all the components involved in the full model. In the present study, intention was
measured as was the subjective norm (the perceived social pressure to perform or not perform a given behaviour) and the attitude towards the behaviour (the general feeling of favourableness or unfavourableness toward performing the behaviour). Perceived behavioural control (the extent to which a person has the required opportunities and resources for the performance of the behaviour) was also assessed. Finally, the theoretical determinants of perceived behavioural control (the likelihood that certain factors might inhibit performance of the behaviour and the importance of these factors) were assessed in order to examine the relationship between perceived behavioural control and its theoretical determinants hypothesized by the Theory of Planned Behaviour. The theoretical determinants of subjective norm and attitude toward the behaviour were not assessed due to the well established relationships between attitude toward the behaviour and subjective norm with their respective theoretical determinants.

Ajzen (1991) has noted that correlations between the constructs of subjective norm and attitude toward the behaviour and their theoretical determinants have been "disappointing". These correlations typically range between .40 and .80. The measurement of these variables was expected to provide a reasonable test of the utility of the Theory of Planned Behaviour in predicting nurses' analgesic administration choices.
Measuring intentions. The Theory of Planned Behaviour specifies that intention and perceived behavioural control make independent contributions to the prediction of behaviour. Providing the behaviour is under some measure of volitional control and if measured correctly, behavioural intention should provide the best predictor of behaviour with perceived behavioural control making an independent, but lesser, contribution. The measurement of all model components, except perceived behavioural control and its determinants, is discussed with regard to the Theory of Reasoned Action (Fishbein & Ajzen, 1975) where these components were originally operationalized.

To measure intention correctly, Ajzen and Fishbein (1980) argue that the level of behavioural specificity among attitudes toward the behaviour, the subjective norm and the intention to perform the behaviour must be equivalent. That is, if a researcher desires to investigate intentions to hire native Canadians during the next month, then the attitude toward hiring native Canadians during the next month, rather than simply the global attitude toward native Canadians must be assessed. Similarly, the subjective norm must be assessed with regard to the hiring of native Canadians in the next month. The level of behavioural specificity must correspond to the action, target, context and time period involved, across the measurement of all constructs within the theory.
Measuring intentions with respect to the two behaviours comprising the behavioural category of interest. Ajzen and Fishbein (1980) operationally define behavioural intention as the likelihood that a person thinks he/she would engage in a given behaviour. Since the behaviour of interest in the current study, nurses’ administration of morphine for pain post-operatively, did not represent a single behaviour but, rather, a limited category of behaviours, two behavioural intentions were assessed, reflecting two dimensions in the analgesic administration behavioural category: the amount of morphine administered and the interval allowed to elapse between administrations of morphine.

In order to arrive at a measure of intention, respondents could be asked to indicate the likelihood of performing specific behaviours on a seven-point semantic differential scale as in the following example:

Example:
How likely is it that you would administer the maximum dosage of morphine allowed for by the prescription order?

unlikely _____:_____:_____:_____:____:____:____ likely
-3 -2 -1 0 +1 +2 +3

A person who receives a score of "+3" would be considered to be more likely to perform the behaviour than a person who receives a score of "0" and much more likely than a person who receives a score of "-3".

In order to obtain a measure of intention which corresponds
to the behavioural category of interest in the current study, one would sum the intention scores for each of the behaviours which constitute the category. In the present study, respondents could be asked to indicate the likelihood of performing another specific behaviour which is part of the behavioural category as in the following example.

Example:
How likely is it that you would administer the next dose of morphine in the shortest time period allowed for by the prescription order?

unlikely ____:____:____:____:____:X:____ likely
-3  -2  -1  0  +1  +2  +3

In order to derive a behavioural intention index for the behavioural category, the above two ratings would be summed, yielding a value of +3 for the behavioural intention index for the behavioural category of nurses' administration of morphine for pain post-operatively.

Measuring attitude toward the behaviour. The attitude towards the behaviour component of the model is defined by Ajzen and Fishbein (1980) as one's general feeling of favourableness or unfavourableness toward performing the specific behaviour in question. As noted before, the attitude towards the behaviour must always refer to a specific action, target, context and time.

In order to assess attitude toward the behaviour, Ajzen and Fishbein (1980) recommend using semantic differential scales
which measure attitudes in terms of bipolar evaluative scales. Responses on each of three or four semantic differential scales are summed to yield the attitude toward the specific behaviour.

For example:

Administering the maximum dosage of morphine allowed for by the prescription order is:

\[
\begin{array}{cccccccc}
good & \text{___:}_X:___:___:___:___:___:___ & \text{bad} \\
+3 & +2 & +1 & 0 & -1 & -2 & -3 \\
\end{array}
\]

\[
\begin{array}{cccccccc}
foolish & \text{___:}_X:___:___:___:___:___:___ & \text{wise} \\
-3 & -2 & -1 & 0 & +1 & +2 & +3 \\
\end{array}
\]

\[
\begin{array}{cccccccc}
helpful & \text{___:}_X:___:___:___:___:___:___ & \text{unhelpful} \\
+3 & +2 & +1 & 0 & -1 & -2 & -3 \\
\end{array}
\]

In the above example the attitude toward the behaviour of administering the maximum dosage of morphine allowed for by the prescription order would be given a value of +3 (the sum of the three semantic differential scales).

Measuring attitude toward the behaviour with respect to the two behaviours comprising the behavioural category of interest. In order to obtain a value for attitude toward the behaviour with regard to a behavioural category of nurses' administration of morphine for pain post-operatively, one must assess the attitude toward each of the specific behaviours which constitute the behavioural category. Therefore, it would be necessary to assess attitude toward the behaviour with regard to administering morphine at the shortest interval allowed for by the prescription order as in the following example:
Administering the next dose of morphine at the shortest interval allowed for by the prescription order is:

**good**

\[
\begin{array}{c}
\text{_____} \\
+3 & +2 & +1 & 0 & -1 & -2 & -3
\end{array}
\]

**bad**

**foolish**

\[
\begin{array}{c}
\text{_____} \\
-3 & -2 & -1 & 0 & +1 & +2 & +3
\end{array}
\]

**wise**

**helpful**

\[
\begin{array}{c}
\text{____X} \\
+3 & +2 & +1 & 0 & -1 & -2 & -3
\end{array}
\]

**unhelpful**

In the above example the attitude toward the behaviour of administering the next dose of morphine at the shortest interval allowed for by the prescription order would be given a value of +1 (the sum of the three semantic differential scales).

The attitude toward the behavioural category, nurses’ administration of morphine for pain post-operatively, is derived by summing the attitude toward each of the specific behaviour which comprise the behavioural category. In the above example, the attitude toward the behavioural category would be given a value of +4 (the sum of the values for the attitude toward each of the specific behaviours which comprise the category).

**Measuring subjective norm.** The "subjective norm" component of the model is defined by Ajzen and Fishbein (1980) as the individual’s perception that most people who are important to him/her think that he/she should or should not perform a particular behaviour. As noted before, measurement of the subjective norm must be equivalent with measurement of other model components in terms of specific action, target, context and time.
Measurement of the subjective norm should reflect the individual's perception that others who are important to him/her would recommend/not recommend performance of the behaviour. This can be assessed on a semantic differential scale as in the following example:

Most people who are important to me think that I should administer the highest dose of morphine allowed for by the prescription order:

unlikely ____:____:____:____:____:____:____ likely

-3  -2  -1  0  +1  +2  +3

Measuring subjective norm with respect to the two behaviours comprising the behavioural category of interest. As in the above example concerning attitude toward the behaviour, in order to obtain a value for the subjective norm with regard to a behavioural category of nurses' administration of morphine for pain post-operatively, one must assess the subjective norm with regard to each of the specific behaviours which constitute the behavioural category. Therefore, it would be necessary to assess the subjective norm with regard to administering morphine at the shortest interval allowed for by the prescription order as in the following example:
Most people who are important to me think that I should administer the next dose of morphine at the shortest interval allowed for by the prescription order:

unlikely ____:____:____:____:____:____ likely

-3  -2  -1  0  +1  +2  +3

The subjective norm with regard to the behavioural category, nurses’ administration of morphine for pain post-operatively, is derived by summing the subjective norm toward each of the specific behaviour which comprise the behavioural category. In the above example, the subjective norm with regard to the behavioural category would be given a value of +3 (the sum of the values for the subjective norm with regard to each of the specific behaviours which comprise the category). All other things being equal, the more a person thinks that important others would recommend the performance of a specific behaviour, the more likely the person is to form such an intention.

Measuring perceived behavioural control and its theoretical determinants. It has been noted that procedures for determining the theoretical determinants of perceived behavioural control have been poorly specified as compared to procedures for determining the theoretical determinants related to subjective norm and attitude toward the behaviour (Valois et al., 1993). Indeed, no accepted procedure has yet been developed and expected correlations between perceived behavioural control and its theoretical determinants are largely unknown. Therefore, the
present study assessed perceived behavioural control directly as well as assessing the theoretical determinants of perceived behavioural control. Doing this provided evidence regarding the prediction of the perceived behavioural component from its theoretical determinants (control beliefs and their perceived importance). Due to the lack of evidence for the prediction of perceived behavioural control from its theoretical determinants, these constructs were compared as to their utility in the prediction of the behavioural intention.

As discussed earlier, Nash et al. (1993) employed a methodology in which perceived behavioural control was assessed directly while measures of attitude towards the behaviour and subjective norm were derived from their theoretical determinants. These authors found that perceived behavioural control assessed directly was the only determinant to make an independent contribution to the prediction of the behavioural intention. This result may have been largely due to the methods of measuring the components in that the measures of attitude toward the behaviour and the subjective norm components were derived from their theoretical components and were, therefore, assessed at a level more temporally distal to intention than the measurement of perceived behavioural control. A further examination of Figure 1 demonstrates that measuring attitude toward the behaviour and subjective norm in terms of their theoretical determinants is more "distal" from intention than the direct measurement of perceived behavioural control. Measuring perceived control
directly while computing attitude toward the behaviour and subjective norm from their theoretical determinants makes the results of any comparison of these constructs in the prediction of intention difficult to interpret. The present study avoided this limitation by assessing each of the three determinants at the same temporal distance from the behavioural intention.

Direct assessment of perceived behavioural control involves, according to Ajzen and Madden (1986), measurement of the degree to which subjects feel in control of administering morphine for pain post-operatively and the ease with which they perform behaviours specific to administering morphine for post-operative pain as in the following example:

To what extent do you feel in control of administering the maximum dosage of morphine allowed for by the prescription order?

not in control -3 -2 -1 0 +1 +2 +3 control

How easy do you feel it would be to administer the maximum dosage of morphine allowed for by the prescription order?

not easy very easy

The perceived behavioural control component is computed by summing subjects' responses across these questions. A person who receives a score of "+6" would be considered to be more likely to perform the behaviour than a person who receives a score of "0"
and much more likely than a person who receives a score of "-6", all other things being equal. In the above example, perceived behavioural control with regard to the specific behaviour of administering the maximum dosage of morphine allowed for by the prescription order would be given a value of -3 (the sum of the two ratings).

Measuring perceived behavioural control directly with respect to the two behaviours comprising the behavioural category of interest. As noted in the above examples, in order to obtain a direct measure of perceived behavioural control for the behavioural category of interest, one would need to obtain responses to the above questions with regard to the other behaviour considered part of the behavioural category as in the following example:

To what extent do you feel in control of administering the next dose of morphine in the shortest interval allowed for by the prescription order?

not in _____:_____:_____:X:_____:_____:_____ in control -3 -2 -1 0 +1 +2 +3 control

How easy do you feel it would be to administer the next dose of morphine in the shortest interval allowed for by the prescription order?

not easy _____:_____:_____:_____:_____:X:_____:_____ very easy -3 -2 -1 0 +1 +2 +3

The perceived behavioural control component with regard to the
specific behaviour of administering the next dose of morphine would be given a value of +1 (the sum of the two ratings). As demonstrated above, one would then sum the perceived behavioural control scores for each of the behaviours which constitute the behavioural category of interest in order to obtain a perceived behavioural control score for the behavioural category. In the example, the perceived behavioural control component for the behavioural category of nurses' administration of morphine for pain post-operatively would receive a value of -2 (the sum of the perceived behavioral control values for each of the specific behaviours which comprise the behavioural category).

The theoretical determinants of perceived behavioural control. With regard to the theoretical determinants of perceived behavioural control, Ajzen (1991) has suggested that "each control belief is multiplied by the perceived power of the particular control factor to facilitate or inhibit performance of the behaviour" (p. 196). However, insufficient detail is provided by Ajzen (1991) regarding how this is specifically to be achieved. The present study replicated methodology employed by Valois et al. (1993) in which subjects were asked to what extent they believed that a set of control factors presented would increase the difficulty of completing a Certificate Law programme as well as the importance associated with each control factor. In order to replicate this methodology in measuring the theoretical determinants of perceived behavioural control one might assess respondent's perception that a set of control
factors might increase the difficulty of, or might prevent them from, administering morphine for pain post-operatively as well as their perception of each control factor's importance.

The theoretical determinants of perceived behavioural control for each of the behaviours comprising the behavioural category of interest. In order to measure the theoretical determinants of perceived behavioural control for the behavioural category, the perceived likelihood that each control factor might prevent performance of the behaviour and the perceived importance of each control factor must be assessed with regard to each of the two specific behaviours which constitute the behavioural category. Control factors presented in the following example are presented as illustrations only. The control factors employed in the main study were determined by subject responses in the preliminary study.

Example:

1. How likely is it that the amount of time you have to complete your duties might prevent you from administering the highest dose of morphine allowed for by the prescription order?

unlikely ____:____:____:____:____:____:____ likely
+3 +2 +1  0  -1  -2  -3

How important a factor is the amount of time you have to complete your duties in your decision to administer the highest dose of morphine allowed for by the prescription order?
not ___:___:___:___:X:___:____ very important 1 2 3 4 5 6 7 important

2. How likely is it that your knowledge of narcotic analgesic medications might prevent you from administering the highest dose of morphine allowed for by the prescription order?
unlikely ___:___:___:___:___:____:___ likely
+3  +2  +1  0  -1  -2  -3] How important a factor is your knowledge of narcotic analgesic medications be in your decision to administer the highest dose of morphine allowed for by the prescription order?

not ___:___:___:___:___:X:____ very important 1 2 3 4 5 6 7 important

3. How likely is it that your own past pain experiences might prevent you from administering the highest dose of morphine allowed for by the prescription order.
unlikely ___:___:___:___:X:___:___ likely
+3  +2  +1  0  -1  -2  -3 How important a factor is your own past pain experiences in your decision to administer the highest dose of morphine allowed for by the prescription order?

not __X__:___:___:___:___:___:___ very important 1 2 3 4 5 6 7 important
Multiplying the difficulty rating of each control belief by the importance of each control factor yields the theoretical determinants of the perceived behavioural control component with regard to that specific behaviour.

In order to measure the theoretical determinant of the perceived behavioural control component for the behavioural category of interest, one must assess the perceived ability of control factors to prevent performance of the behaviour and the importance of control factors with regard to the other behaviour comprising the behavioural category as in the following example:

1. How likely is it that the amount of time you have to complete your duties might prevent you from administering the next dose of morphine in the shortest interval allowed for by the prescription order?

   unlikely  _____:____:____:____:____:____:____: X  likely  
   +3  +2  +1  0  -1  -2  -3

   How important a factor is the amount of time you have to complete your duties in your decision to administer the next dose of morphine in the shortest interval allowed for by the prescription order?

  not  _____:____:____:____:____:____:____: X  very  
  important  1  2  3  4  5  6  7  important

2. How likely is it that your knowledge of narcotic analgesic medications might prevent you from administering the next dose of morphine in the shortest interval allowed for by the
prescription order?

unlikely ____:____:____:____:____:____:____:____:____
likely +3  +2  +1  0  -1  -2  -3

How important a factor is your knowledge of narcotic analgesic medications in your decision to administer the next dose of morphine in the shortest interval allowed for by the prescription order?

not X:____:____:____:____:____:____:____:____ very important 1  2  3  4  5  6  7 important

3. How likely is it that your own past pain experiences might prevent you from administering the next dose of morphine in the shortest interval allowed for by the prescription order?

unlikely X:____:____:____:____:____:____:____:____ likely +3  +2  +1  0  -1  -2  -3

How important a factor is your own past pain experience in your decision to administer the next dose of morphine in the shortest interval allowed for by the prescription order?

not ____:____:____:____:____:____:____:X very important 1  2  3  4  5  6  7 important

As in the above example, multiplying the difficulty rating of each control belief by the importance of each control factor yields the theoretical determinants of the perceived behavioural control component with regard to the second specific behaviour comprising the behavioural category. Figure 2 presents the constructs in Ajzen’s (1991) Theory of Planned Behaviour which were measured in the present study.
Figure 2

The Constructs in Ajzen’s (1991) Theory of Planned Behaviour

Which Will be Measured in the Present Study.
The Present Study.

In the present study, Ajzen's (1991) Theory of Planned Behaviour was utilized to specify cognitive precursors to nurses' decisions to administer morphine for pain post-operatively. The Theory of Planned Behaviour was considered more appropriate than the Theory of Reasoned Action due to the lack of complete volitional control involved in the specific behaviours of interest. Further, given the lack of studies designed to explain the persistent tendency for patients to experience unnecessary pain, such an approach is timely and important.

Selecting the Research Sample.

Nurses were selected as the sample of interest in the current research. Bagley and colleagues (Bagley, Falinski, Garzino & Hooker, 1982) have suggested that nurses are the health care professionals with the most control over the management of patient pain. A research approach similar to that proposed here but utilizing physicians as the research sample might provide equally useful information regarding how patient pain is managed but was considered beyond the scope of the present investigation. Nurses comprised the sample in both the preliminary and main study described below.

The Preliminary Study.

A preliminary study was conducted to determine the relevant control factors in the administration of morphine for post-
operative pain and to pilot the pain management vignette. The most commonly occurring control factors provided by respondents in the preliminary study were used in the main study.

The Main Study.

The pain management vignette. Nurse subjects were presented with a vignette in which a patient in pain is described and with regard to which the subsequent study questions were answered. As specified by Ajzen (1991), the questions which followed the vignette corresponded to the vignette in terms of action, target, context and time period involved. It was also considered important that sufficient information was given in the vignette regarding the patient and the treatment provided to allow nurse subjects to make meaningful judgements about the administration of morphine to manage that patient’s post-operative pain.

The vignette was devised by the author and described a patient who had undergone a surgical procedure and complained of pain. A prescription order for morphine was part of the vignette and included a dosage as well as a suggested interval between administrations. The pain management vignette was reviewed by a senior nursing practitioner at a general hospital in Prince Albert, Saskatchewan. It was assessed for realism, consistency with nurses’ experience, clarity and sufficiency of information. Editing of the vignette with regard to these dimensions was conducted based on feedback received from the senior nursing practitioner.
The vignette was then pilot tested with a sample of nurses to assess the same dimensions. Criteria for the use of the vignette were established such that average ratings above the mid-point on three of the four above-noted dimensions would be considered satisfactory. Should this condition have not been met, feedback from the preliminary test subjects would have informed further editing of the vignette before it was piloted again. When ratings met the above criteria, the vignette would be used in the main study.

The Effect of External Variables.

As discussed earlier, variables considered "external" to the model specified by the Theory of Planned Behaviour have an indirect influence on the formation of an intention to enact a specific behaviour through their influence on beliefs and perceptions. To test this assumption, one type of external variable was assessed in the present study, a measure of general beliefs about pain and its management (i.e., the Pain Beliefs Questionnaire).

General belief questionnaires have been used in the prediction of many types of behaviour, often with inconsistent results (Ajzen, 1991). One general belief questionnaire examined for its utility in predicting nurses' narcotic analgesic administration practices is the Pain Beliefs Questionnaire (Jurgens, 1995), a 22-item inventory of general pain beliefs. McCaffery's (1979) concept of "pain myths" guides scoring of the
inventory. "Pain myths" are defined as "misconceptions that cause us to doubt the patient’s pain when we already have information from the patient about its existence and characteristics" (p. 10) (McCaffery, 1979). McCaffery (1979) elaborates this definition;

"These misconceptions involve: (1) who has the authority to judge pain, (2) responses typical of acute pain and adaptation, (3) pain of unknown cause, (4) predictability and variability of the duration and severity of pain, (5) how much pain a patient "should" tolerate, and (6) agreement between patient and staff." (p. 10).

McCaffery (1979) has defined pain as "whatever the experiencing person says it is, existing whenever he says it does" (p. 11). Items in the Pain Beliefs Questionnaire are scored such that the higher the score on the inventory, the greater the respondent’s adherence to beliefs which would be presumed to lead to lower usage of analgesic medication, "myths about pain" according to McCaffery (1979). As Pain Beliefs Questionnaire items are not specific with regard to target, action, time or context, as suggested in the Theory of Planned Behaviour, it is clearly a general measure of pain beliefs (Appendix II contains a copy of the Pain Beliefs Questionnaire).

Previous research by Jurgens (1995) with the Pain Beliefs Questionnaire (PBQ) (Study A - reported in Appendix I) found a near-significant partial correlation, controlling for social
desirability in responding, between nurses’ scores on the questionnaire and one of three indices of patient pain. However, the Pain Beliefs Questionnaire was not found to be significantly correlated with indices of nurses’ narcotic analgesic administration practices, namely the amount of analgesia administered and the interval between analgesic administrations. These results suggest that one should further investigate the relationship between the Pain Beliefs Questionnaire and processes involved in narcotic analgesic administration decisions. One way to do so would be to include the Pain Beliefs Questionnaire in the present study to examine whether it constitutes an "external variable" according to the specifics of the Theory of Planned Behaviour. The inclusion of the Pain Beliefs Questionnaire also provided a more rigorous test of the model proposed by the Theory of Planned Behaviour in that the effect of PBQ scores on intention should be mediated by cognitive variables considered more temporally proximal by Ajzen (1991). Finally, the present study investigated the relationship between the Pain Beliefs Questionnaire and the specific behavioural intentions to engage in behaviours which comprise the behavioural category of interest.

Ethical Considerations in the Present Research

This section will address ethical considerations in the present research with reference to the Ethical principles in the conduct of research with human participants (APA, 1973).
Subjects were informed as to the study's objectives and procedures and were assured of their anonymity. They were informed that their participation was voluntary. Appendix III contains a copy of information presented to subjects in the preliminary study. Appendix IV contains a copy of information presented to subjects in the main study. Return of the anonymous questionnaire was considered an indication of their consent to participate. No deception was involved in the present research as participants were fully informed regarding the methods and objectives employed. All subjects who expressed an interest will be mailed a written summary of the results of the present study.

Definitions

The following definitions are taken from previous work with the Theory of Planned Behaviour and the Theory of Reasoned Action from which the Theory of Planned Behaviour was derived.

With regard to behavioural intentions, Ajzen (1991) has stated, "Intentions are assumed to capture the motivational factors that influence a behaviour; they are indications of how hard people are willing to try...of how much of an effort they are planning to exert, in order to perform the behaviour" (p. 181). Intention is predicted by the attitude towards the behaviour, the subjective norm and perceived behavioural control. Attitude towards the behaviour is defined by Ajzen and Fishbein (1980) as one's general feeling of favourableness or unfavourableness toward performing a specific behaviour. The
subjective norm is defined as the belief that referents (i.e., important or significant others) would recommend/not recommend the performance of a specific behaviour. Perceived behavioural control is defined by Ajzen (1987) as "the perceived ease or difficulty of performing the behaviour under consideration" (p. 44). Ajzen (1985) has also stated that perceived behavioural control may be defined as being related to the possession of various personal attributes and characteristics needed to perform the behaviour in question. It is also suggested that this variable reflects past experience as well as the perception that certain factors will inhibit or facilitate performance of the specific behaviour (Ajzen, 1985).

Attitudes are said to be a function of beliefs although beliefs are not explicitly defined by Ajzen and Fishbein (1980) or by Ajzen (1985, 1991). In the present study, the theoretical determinants of perceived behavioural control; beliefs that certain factors have the power to facilitate or inhibit the performance of a behaviour and the perceived importance of these factors in facilitating or inhibiting performance of the behaviour, will be assessed.

Finally, external variables are defined by Ajzen and Fishbein (1980) as variables related more distally to behaviour than attitudes or beliefs towards the target behaviour. The authors list examples of external variables: "personality characteristics...demographic variables...and such factors as social role, status, socialization, intelligence and kinship
patterns" (p. 9).

Hypotheses

(1) The multiplicative composite of ratings of the importance of control factors and the importance associated with each control factor should be the best predictor of perceived behavioural control assessed directly. That is, the Theory of Planned Behaviour specifies that the theoretical determinants of perceived behavioural control are salient beliefs that events or obstacles to performance of the behaviour will occur multiplied by the perceived importance of each event or obstacle in reducing behavioural control.

(2) The multiple regression of intention on attitude, subjective norm and perceived behavioural control should be significant. The standardized beta weights of each will be used to determine the relative power of attitude, subjective norm and perceived behavioural control in the prediction of intention.

(3) Perceived behavioural control should mediate any relationship between the theoretical determinants of perceived behavioural control (defined above) and behavioural intention.

(4) According to Ajzen's 1985 formulation of the Theory of Planned Behaviour, an interaction is hypothesized between perceived behavioural control and the weighted sum of attitude toward the behaviour and subjective norm in the prediction of behavioural intention.

(5) The Pain Beliefs Questionnaire, as an external
variable, should not produce an increment greater than 5% in the proportion of variance in intention accounted for by attitude, subjective norm and perceived behavioural control. The effects of external variables, according to the Theory of Planned Behaviour (Ajzen, 1991), should be entirely mediated by the more proximal cognitive variables specified by the model.
Method

The Preliminary Study.

A preliminary study was conducted to determine the relevant control factors in the administration of morphine for pain post-operatively and to pilot the pain management vignette.

Subjects. Subjects were consenting nurses employed in hospitals in Prince Albert, Saskatchewan. Thirty questionnaires were distributed and ten were returned for a response rate of 33%. A sample of ten subjects was considered sufficient for the purposes of the preliminary study.

Procedure. All subjects were provided with an information sheet which outlined the objectives of the study and subjects' contributions. Subjects were approached by the researcher and asked to participate in a study involving two parts. In the first part, respondents provided information about factors which facilitate or inhibit the administration of morphine for post-operative pain (control factors). In the second part, subjects provided ratings to establish the practical utility of a vignette involving pain management. They were informed that the information gathered would be used in a study which will examine nurses' pain management processes.

Subjects were presented with instructions requesting them to list factors which inhibit or facilitate the administration of morphine for post-operative pain. A second part asked them to rate the pain management vignette for realism, accuracy, clarity and comprehensiveness (see Appendix V for a copy of the
preliminary study subject materials). The number of control factors used in the main study was limited to the five most commonly occurring responses so that the resulting questionnaire would not be unwieldy and overly lengthy. This number of alternatives was considered sufficient to capture the most important responses. It was determined a priori that at least 10 subjects would be utilized in the preliminary study to secure a small and practical but representative sample of the potential responses of the population. This number was considered reasonable due to the likelihood that the number of possible control factors is small. As well, this number of subjects was expected to be sufficient to provide information about the practical utility of the pain management vignette.

The Main Study

Subjects. Subjects were consenting nurses employed in hospitals in Saskatoon, Regina, Prince Albert, Nipawin, Melfort, Humboldt, Moose Jaw, Swift Current, North Battleford and Yorkton, Saskatchewan. Nurses with experience treating post-operative pain in patients who had undergone abdominal surgery were solicited for participation. The researcher visited hospitals in each of the above noted communities and made a brief presentation regarding the research to on-duty nurses who were able to attend. Subject materials were handed out to interested participants. Packages of subject materials for nurses who could not attend the presentation were usually placed in the nurses’ individual ward
mail slots or were handed out to the nurses individually by the Nursing Unit Manager. In this manner, approximately 650 packages of subject materials were distributed. Because of the manner in which they were administered, however, it is not possible to determine how many packages were not received by potential nurse participants. Therefore, the response rate of subject materials cited below, must be considered to be an estimate and may somewhat underestimate the true response rate.

Of the 650 packages of subject materials administered, 149 were returned, for a response rate of approximately 23%. No demographic data were collected for the sample.

Procedure. Subjects were approached by the researcher and asked to participate in a study investigating nurses' pain management decision processes. Subjects received an information sheet covering the subject materials which outlined the objectives and procedures of the study and the ethical assurances concerning confidentiality, anonymity and voluntary withdrawal. Returning the materials indicated subjects' consent to participate.

Subjects were presented with a vignette which described a patient who complains of pain post-operatively (see Appendix VI for a copy of main study subject materials). Subjects were asked to respond to items assessing attitude toward the behaviour, subjective norm and perceived behavioural control as well as the influence of a list of control factors related to two specific behaviours, 1) the administration to the patient in the vignette
of the maximum amount of morphine allowed for by the prescription order and 2) the administration of morphine to the patient at the shortest interval allowed for by the prescription order. The list of possible control factors was derived from the preliminary study described above.

In order to assess behavioural intention, subjects were presented with two semantic differential scales for each of the two behaviours which comprise the behavioural category. The first inquired into the likelihood of performing the behaviour, while the second inquired into the subjects’ intention of performing the behaviour. Responses on each semantic differential were summed to yield the behavioural intention for each specific behaviour. These values were then summed to yield the behavioural intention toward the behavioural category.

In order to assess attitude toward the behaviour, subjects were presented with three evaluative semantic differential scales for each of the two behaviours which comprise the behavioural category. Responses on each semantic differential were summed to yield the attitude toward each specific behaviour. These values were then summed to yield the attitude toward the behavioural category.

In order to assess the subjective norm component, subjects were presented with a single semantic differential inquiring into the likelihood that important others would recommend performance of each of the specific behaviours which comprise the behavioural category. Responses on the semantic differential for each
specific behaviour were then summed to yield the subjective norm component with regard to the behavioural category.

Subjects were presented with two questions to directly assess perceived behavioural control for each of the two specific behaviours. The first of these questions inquired into how much control they feel in administering morphine for post-operative pain with regard to each of the specific behaviours which constitute the behavioural category. The second question asked how easy respondents believed the administration of morphine for post-operative pain to be with regard to each of the specific behaviours which constituted the behavioural category. These ratings were added to yield a direct measure of perceived behavioural control for each specific behaviour and were then summed to yield the component for the behavioural category.

Subjects were also presented with a list of control factors and asked to indicate the likelihood that each of the control factors might prevent performance of each of the two specific behaviours. Subjects then rated how important each of the control factors were in their decision to perform each of the two specific behaviours. Ajzen (1991) recommends that these ratings be combined multiplicatively. That is, the perceived power of control factors to prevent performance of the specific behaviour is to be multiplied by the importance of the control factor for that behaviour. However, Evans (1991) has argued that the utility of multiplicative composites in the prediction of constructs is an empirical issue and that the best way in which
to combine the determinants of constructs, additively or multiplicatively, must be determined through hierarchical multiple regression. In the present study, the optimal method of combining the theoretical determinants of perceived behavioural control, multiplicatively or additively, was determined in the statistical analyses. The subjects were also asked to complete the Pain Beliefs Questionnaire and the resulting scores were conceptualized as an "external variable" and were analyzed as such according to the specifics of the Theory of Planned Behaviour.

Finally, the subjects were invited to answer a series of free response questions which provided them an opportunity to reveal themes which were of concern to them as regards pain management. The written responses were reviewed by the author and themes were presented in terms of the frequency with which they were cited by nurse subjects. (See Appendix VII for a copy of the free response questions). Responses to these questions also served as an informal validity check regarding the appropriateness of using the Theory of Planned Behaviour to account for nurses’ pain management decision processes. For example, if responses to the open-ended questions had suggested that alternatives to analgesic pain management were favoured over traditional narcotic analgesic administration, then focussing on narcotic analgesic administration in that particular institution may not have been a valid approach.
Results

The Preliminary Study.

A preliminary study was conducted to solicit salient control beliefs regarding the administration of morphine for pain post-operatively and to assess the realism, consistency with nurses' experience, clarity and sufficiency of information of the pain management vignette. Appendix V contains a copy of preliminary study subject materials. The vignette was reviewed with regard to the above dimensions by a senior nursing practitioner and was edited prior to being piloted with a sample of registered nurses at a large hospital in Saskatchewan.

The following control beliefs were identified in subjects' responses to the questionnaire: (1) the amount of time nurses have to complete their duties, (2) nurses' knowledge of narcotic analgesic medications, (3) nurses' own past pain experiences, (4) the patient's willingness to accept analgesia, and (5) the adequacy of documentation regarding the patient's response to previous analgesic administrations. These control factors were employed in the main study which followed.

Ratings of the vignette on the dimensions of realism, consistency with nurses' experience, clarity and sufficiency of information met the criteria established. Table 1 presents subjects' ratings of the vignette on the above dimensions. Because ratings of the vignette were acceptable, it was used in the main study which followed.
Table 1

Ratings of the Pain Management Vignette in the Preliminary Study.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realism</td>
<td>6.22</td>
<td>1.30</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Consistency with Experience</td>
<td>5.67</td>
<td>.67</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Clarity</td>
<td>5.78</td>
<td>1.99</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Sufficiency of Information</td>
<td>5.11</td>
<td>2.09</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>
Reliability of the Pain Beliefs Questionnaire.

Appendix VIII contains descriptive data for each of the 22 items of the Pain Beliefs Questionnaire from main study data. Appendix IX contains item-total statistics for each of the 22 items from main study data. The coefficient alpha for the Pain Beliefs Questionnaire using this sample was found to be .83.

Tests of Major Hypotheses

Table 2 presents descriptive data for the measures used in this study. Coefficient alpha values, presented in Table 2, for each of the scales were considered acceptable although the lower than anticipated coefficient alpha value for the behavioural intention scale likely places an upper limit on the strength of relationships between intention and other model variables. This issue will be discussed below.

Hypothesis one: According to the first hypothesis, the multiplicativc composite of control beliefs should be the best predictor of perceived behavioural control. Items which assess the beliefs about the likelihood that each control factor might prevent subjects from performing each of the two behaviours and the importance of each control factor in the decision to perform each of the two behaviours may be found in Appendix VI which contains the subject materials.

Both in the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and in the Theory of Planned Behaviour (Ajzen, 1985, 1991), researchers have been directed to multiply the beliefs and
Table 2

Descriptive Data for all Measures.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Coeff. alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>9.55</td>
<td>3.89</td>
<td>.69</td>
</tr>
<tr>
<td>Attitude</td>
<td>39.18</td>
<td>5.22</td>
<td>.93</td>
</tr>
<tr>
<td>Subj. Norm</td>
<td>12.21</td>
<td>2.68</td>
<td>.84</td>
</tr>
<tr>
<td>PBC</td>
<td>9.96</td>
<td>3.39</td>
<td>.82</td>
</tr>
<tr>
<td>PBQ</td>
<td>48.91</td>
<td>12.93</td>
<td>.83</td>
</tr>
</tbody>
</table>

Note. Abbreviations as follows: Subj. Norm = Subjective Norm; Intention = Behavioural Intention; PBQ = Pain Beliefs Questionnaire; Attitude = Attitude Toward the Behaviour; PBC = Directly assessed Perceived Behavioural Control.
evaluations to arrive at the theoretical determinants of attitudes assessed directly. In the case of perceived behavioural control, the theoretical determinants are control beliefs and the perceived importance of these beliefs in facilitating or inhibiting performance of the behaviour. However, recent reports by Evans (1991) and others (Arnold, 1982; Hewstone & Young, 1988; Stone & Hollenbeck, 1984) have suggested that correlational statistical procedures to investigate the form of relationships between control beliefs and perceived behavioural control have been misapplied.

Evans (1991) and others (Hewstone & Young, 1988) have argued against the use of bivariate correlational analyses to find evidence related to the form of relationships in "expectancy-value" models such as the Theory of Planned Behaviour. Hewstone and Young (1988) demonstrated that correlational analyses were sensitive to changes in scoring methods for the independent variables. That is, when the method of scoring theoretical determinants was changed, their correlation with the constructs they were to determine changed as well. To remedy this situation, they argued for the use of hierarchical multiple regression in which the interaction term was entered on the second step, after the linear effects of the components which comprised the interaction term were controlled for. The suggestions of these authors cast doubt on results reported in the literature which rely on bivariate correlational analyses.

To this point, it has been uncommon for researchers to apply
appropriate statistical analyses to investigate interactions. Therefore, Ajzen's suggestion that perceived behavioural control is determined by a multiplicative function of (1) the perceived likelihood that various facilitory and inhibitory factors will be present at the time one is to perform the behaviour, and (2) the perceived importance of those factors in facilitating or inhibiting performance of the behaviour has not been adequately tested.

Therefore, in accordance with the recommendations of Evans (1991), in the present study, perceived behavioural control was regressed against the linear effects of control beliefs and their perceived importance before the multiplicative composites were entered on the second step. A significant change in variance accounted for in behavioural intention by the multiplicative composites over and above the linear effects of their components would provide evidence in favour of Ajzen's (1985, 1991) hypothesis that multiplying belief components yields the determinant of perceived behavioural control.

Table 3 presents the results of this analysis. The increment in variance accounted for in behavioural intention by the multiplicative composites of control beliefs over and above that accounted for by the main effects of the components was nonsignificant. The results of this analysis, therefore, provide evidence for an additive combination of control beliefs as the best predictor of directly-assessed perceived behavioural control. This is clear evidence against Ajzen's (1991) theory.
Table 3

Regression Analysis of Proportions of Variance Accounted for in Perceived Behavioural Control by the Multiplicative and Linear Effects of Control Beliefs.

<table>
<thead>
<tr>
<th>Variables Entered</th>
<th>R²</th>
<th>R² Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Belief Components - Beliefs About Control Factors + Ratings of Their Importance in Facilitating or Inhibiting Performance of the Behaviour</td>
<td>.24*</td>
<td>.24*</td>
</tr>
<tr>
<td>Multiplicative Composites of Control Beliefs</td>
<td>.32*</td>
<td>.08</td>
</tr>
</tbody>
</table>

*p < .05
Both the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the Theory of Planned Behaviour (Ajzen, 1985, 1991) have suggested the multiplication of belief components. With regard to perceived behavioural control, the probability that an event or obstacle might occur is to be multiplied by the importance of the event or obstacle in facilitating or inhibiting the performance of the behaviour. Failure to find evidence for the importance of the multiplicative composite, then, is clear evidence against Ajzen's (1985, 1991) theory. The relationships between behavioural intention and specific beliefs about control factors and their importance in preventing performance of the behaviour are considered later in this section.

**Hypothesis two.** According to the second hypothesis, the multiple regression of behavioural intention on attitude toward the behaviour, perceived behavioural control and subjective norm should be significant. Table 4 presents results of regression analyses conducted to test this hypothesis. An examination of Table 4 reveals that this hypothesis is supported. Also, it can be seen that both attitude toward the behaviour and perceived behavioural control make independent contributions to the prediction of behavioural intention. The subjective norm failed to make an independent contribution to the prediction of behavioural intention as the beta associated with subjective norm in the prediction of behavioural intention was nonsignificant.

With regard to perceived behavioural control, these results indicate that the more the nurse subject perceived that he/she
Table 4

Regression Analysis - Betas Associated with the Immediate Determinants of Behavioural Intention.

<table>
<thead>
<tr>
<th>Variables Entered</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBC</td>
<td>.1759</td>
<td>2.24</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>Subj. Norm</td>
<td>.1087</td>
<td>1.58</td>
<td>.1155</td>
</tr>
<tr>
<td>Attitude</td>
<td>.5456</td>
<td>6.28</td>
<td>&lt; .0001</td>
</tr>
</tbody>
</table>

Note. Abbreviations as follows: Subj. Norm = Subjective Norm; Attitude = Attitude Toward the Behaviour; PBC = Directly assessed Perceived Behavioural Control.
had control over the administration of morphine for his/her patient’s post-operative pain and the more that he/she perceived that it would be easy to perform this behaviour, the greater the behavioural intention to administer morphine for pain post-operatively.

With regard to attitude toward the behaviour, these results indicate that the more the nurse subject thought that administering morphine for pain post-operatively was good, wise and helpful, the greater the behavioural intention to administer morphine for pain post-operatively.

**Hypothesis three.** In order to test the third hypothesis, that perceived behavioural control should mediate any relationship between the multiplicative composite of control beliefs and behavioural intention, it was necessary to find evidence for the utility of multiplicative composites in the prediction of perceived behavioural control. This was not found (see Hypothesis one). Therefore, the third hypothesis was disconfirmed due to the absence of a relationship between the multiplicative composite of control beliefs and perceived behavioural control.

**Hypothesis four.** The fourth hypothesis stated that perceived behavioural control should interact with the weighted sum of attitude toward the behaviour and subjective norm, such that as subjective norm and attitude towards the behaviour increase, one’s intention to perform the behaviour increases only in situations where high control is perceived. When little or no
control is perceived, the behavioural intention was hypothesized to remain constant and low even when attitude toward the behaviour and subjective norm values increased. For example, one's attitude towards obtaining a million dollars might well be positive and one would anticipate the support of significant others (the subjective norm) to be similarly positive. However, one would be unlikely to form a behavioural intention to obtain a million dollars unless there was a reasonable certainty of behavioural control. If behavioural control over obtaining a million dollars was very low or absent, one would be unlikely to form an intention to obtain a million dollars despite a positive attitude toward the behaviour and the support of important others (the subjective norm).

Despite the fact that Ajzen hypothesized the above interaction in his original formulation of the Theory of Planned Behaviour (Ajzen, 1985), later formulations have not included this hypothesis (Ajzen, 1991; Ajzen & Driver, 1992) perhaps due to a failure in research efforts to demonstrate it. However, the hypothesis regarding interactions of attitude toward the behaviour and subjective norm with perceived behavioural control are logical outgrowths of the Theory of Planned Behaviour. In order to perform a thorough test of the theory and its hypotheses, therefore, a regression analysis was conducted to test for the interaction described above. The interaction term was computed by multiplying each of attitude toward the behaviour and subjective norm by their respective standardized beta weights.
and adding these products. This result was then multiplied by directly assessed perceived behavioural control scores to produce the interaction term tested in the analysis. Table 5 presents the results of this analysis. An examination of Table 5 reveals a nonsignificant change in the proportion of variance accounted for in intention by the interaction term over and above that accounted for by the main effects. No evidence for an interaction between subjective norm and attitude toward the behaviour with perceived behavioural control was found.

These results indicate that lower ratings of ease and control in performing the behaviour (perceived behavioural control) were not necessarily associated with low levels of behavioural intention. The levels of subjective norm (the perceived opinion of important others) and attitude toward the behaviour (the extent to which performance of the behaviour is described as good, helpful and wise) continued to be important in the prediction of the behavioural intention, regardless of the level of perceived behavioural control.

Hypothesis five. As suggested in the fifth hypothesis, the Pain Beliefs Questionnaire constitutes an external variable as operationalized by the Theory of Planned Behaviour and so should not produce a significant increment in the proportion of variance accounted for in intention by more proximal model components: attitude toward the behaviour, subjective norm, perceived behavioural control and control beliefs. The suggestion that the increment in proportion of variance accounted for should not
Table 5

Hierarchical Regression Analysis - Testing for an Interaction Among the Immediate Predictors of Intention.

<table>
<thead>
<tr>
<th>Variables Entered</th>
<th>R²</th>
<th>R² Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subj. Norm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>.55****</td>
<td>.55****</td>
</tr>
<tr>
<td>Interaction term</td>
<td>.55****</td>
<td>.00</td>
</tr>
</tbody>
</table>

****p < .0001

Note. Abbreviations as follows: Attitude = Attitude Toward the Behaviour; Subj. Norm = Subjective Norm; PBC = Directly assessed Perceived Behavioural Control; Interaction Term = ((Attitude x beta) + (Subj. Norm x beta)) x Control
exceed 5% was arbitrarily determined. Table 6 presents the results of the regression analysis performed to address this hypothesis. An examination of Table 6 reveals that Pain Beliefs Questionnaire scores produced a 1% increment in the proportion of variance in intention scores accounted for by attitude toward the behaviour, subjective norm, perceived behavioural control and control beliefs. This result, then, is supportive of the fifth hypothesis.

Statistical analyses were conducted to determine whether the effect of Pain Beliefs Questionnaire scores on behavioural intention was mediated by attitude toward the behaviour. Neither subjective norm (r = -.0483), nor perceived behavioural control (r = .1018) exhibited a relationship with Pain Beliefs Questionnaire scores and so were not considered in this analysis. The correlation between Pain Beliefs Questionnaire scores and attitude, however, was significant (r = .1785, p < .05) and so the possibility of attitude toward the behaviour mediating a relationship between Pain Beliefs Questionnaire scores existed.

In order to demonsrtate that attitude toward the behaviour mediates the relationship between Pain Beliefs Questionnaire scores, four relationships must be confirmed. First, a relationship between Pain Beliefs Questionnaire scores and behavioural intention must be demonstrated. This relationship was confirmed by regressing intention directly on Pain Beliefs Questionnaire scores (R² = .04, p = .0106).

The second relationship which must be demonstrated is a
Table 6

Hierarchical Regression Analysis of the Proportion of Variance
Accounted for in Intention by PBQ After Controlling for all Other
Independent Variables.

<table>
<thead>
<tr>
<th>Variables Entered</th>
<th>R²</th>
<th>R² Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>.62****</td>
<td>.62****</td>
</tr>
<tr>
<td>Subj. Norm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Beliefs and Rating of their Importance</td>
<td>.62****</td>
<td>.62****</td>
</tr>
<tr>
<td>PBQ</td>
<td>.63****</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>*p &lt; .05  **p &lt; .01  ***p &lt; .001  ****p &lt; .0001</td>
<td></td>
</tr>
</tbody>
</table>

Note. Abbreviations as follows: Attitude = Attitude Toward the Behaviour; Subj. Norm = Subjective Norm; PBC = Directly assessed Perceived Behavioural Control; PBQ = Pain Beliefs Questionnaire scores
relationship between Pain Beliefs Questionnaire scores and attitude toward the behaviour. This relationship was confirmed by regressing attitude toward the behaviour on Pain Beliefs Questionnaire scores. The proportion of variance accounted for in attitude toward the behaviour by Pain Beliefs Questionnaire scores was 3% (p = .0294).

Third, a relationship between attitude toward the behaviour and behavioural intention must be demonstrated. This was demonstrated by a highly significant proportion of variance accounted for in behavioural intention by attitude toward the behaviour (see Table 4).

Finally, if attitude toward the behaviour mediates the relationship between Pain Beliefs Questionnaire scores and behavioural intention, this relationship should be substantially attenuated when attitude towards the behaviour is controlled for in a regression analysis. That is, the proportion of variance accounted for in intention by Pain Beliefs Questionnaire scores should be substantially smaller when attitude toward the behaviour is controlled for than when intention is regressed directly on Pain Beliefs Questionnaire scores. The results of this analysis are presented in Table 7. The increment in proportion of variance in behavioural intention accounted for by Pain Beliefs Questionnaire scores over and above that accounted for by attitude toward the behaviour was .7% (see $R^2$ Change, Table 7). Comparing this proportion with the proportion of variance in behavioural intention accounted for Pain Beliefs
Table 7

Hierarchical Regression Analysis of the Proportion of Variance Accounted for in Intention by Attitude Toward the Behaviour and Pain Beliefs Questionnaire Scores.

<table>
<thead>
<tr>
<th>Variables Entered</th>
<th>R²</th>
<th>R² Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>.53****</td>
<td>.53****</td>
</tr>
<tr>
<td>PBQ</td>
<td>.53****</td>
<td>.007*</td>
</tr>
</tbody>
</table>

****p < .0001

*R² change does not equal the change in R² due to rounding.

Note. Abbreviations as follows: Attitude = Attitude Toward the Behaviour; PBQ = Pain Beliefs Questionnaire scores
Questionnaire scores alone ($R^2 = .04$) yields information regarding the extent to which attitude toward the behaviour mediates the relationship between Pain Beliefs Questionnaire scores and behavioural intention. It is clear from the preceding analysis that attitude toward the behaviour mediates the relationship between Pain Beliefs Questionnaire scores and behavioural intention. Although the total proportions of variance accounted for are small, controlling for attitude toward the behaviour reduced the variance accounted for in behavioural intention by Pain Beliefs Questionnaire scores to nonsignificance.

In terms of the specific measures, the above result indicates that the relationship between general beliefs about pain and its management and behavioural intention is accounted for by specific attitudes towards performance of the behaviour, that is, by the extent to which performance of the behaviour may be characterized as good, helpful and wise.

Figure 3 presents relationships between model components of the Theory of Planned Behaviour based on the present data. Control beliefs and their perceived importance in inhibiting or facilitating performance of the behaviour are considered additively, rather than as multiplicative composites, given the results of the current analyses.
Figure 3

Relationships Between Model Components of the Theory of Planned Behaviour Based on the Present Data.

Note. Roman numerals along paths denote the step in the hierarchical regression analysis on which the component was entered.
Note. Solid lines denote direct paths from components to intention. Dotted lines denote mediation of a relationship between a component and intention.
Note. $R^2$ Change is presented along paths from control beliefs and their perceived importance (20 factors) because of the inability to compute a single beta for these constructs.
**Correlations between specific control beliefs and behavioural intention.**

Specific control beliefs were correlated with behavioural intention scores to improve understanding of the characteristics of subjects who intended to administer the highest allowable dose of morphine to the patient in the vignette at the shortest allowable interval. This was justified by the strong relationship between control beliefs and behavioural intention. Significant positive correlations were found between the following control beliefs and the behavioural intention with regard to both of the behaviours making up the behavioural category (administering morphine 15 mg. I.M. and administering the next dose of morphine in 4 h):

1) Nurses' knowledge of narcotic analgesics.

2) Nurses' own past pain experiences.

3) The adequacy of past documentation regarding the patient's response to previous analgesic administrations.

High behavioural intentions were associated with responses indicating that the above beliefs were unlikely to affect the difficulty of administering both morphine 15 mg I.M. and administering the next dose of morphine in 4 hours.

The following control belief was found to possess a negative correlation with the behavioural intention:

1) The time nurses have to complete their duties with regard to the decision to administer the next dose of
morphine in 4 h.
That is, high scores on behavioural intention were associated with responses indicating that the above control belief is likely to affect the difficulty of administering the next dose of morphine in 4 hours.

Finally, the following beliefs regarding the importance of control beliefs to inhibit or facilitate performance of the behaviour were found to possess a negative correlation with behavioural intention:

1) The importance of the amount of time to complete duties with regard to the decision to administer morphine 15 mg I.M.
2) The importance of nurses' own past pain experiences in their decision to administer morphine 15 mg. I.M.
3) The importance of the adequacy of charting regarding the patient's response to previous analgesic administrations in nurses' decisions to administer the next dose of morphine in 4 h.

High scores on behavioural intention were associated with responses indicating that the above beliefs about the importance of control beliefs were unimportant in the decisions noted.

Analysis of Nurses' Written Responses.
Subjects completed free response questions which elicited their opinions regarding pain management (Appendix VII contains a copy of the free response questions). Themes were identified from
subjects’ written responses in order to describe concerns of the sample regarding pain management. Written responses were also compared with the results of the quantitative analysis to assess, to some extent, the validity of the quantitative content. For each of the five questions, subjects first responded "yes" or "no" to an introductory question and then were invited to elaborate using a free response format. Table 8 presents frequencies and percentages of "yes" responses to the introductory questions.

In the analysis of nurses’ written responses 14 of 149 (10.2%) nurses in the sample failed to respond to the free response questions. In analysis of written responses in the remaining 135 subjects, four major themes emerged: (a) Personal goals for pain management, (b) Consultation practices, (c) Criticisms of institutional pain management, and (d) Methods of improving pain management systems. Each of these will be considered in turn.

**Personal goals for pain management.** Analysis of "yes/no" responses indicated that the majority of subjects believed that not all patient pain could be eliminated. When asked to indicate their personal goal in pain management, the vast majority indicated that it was to "make the patient as comfortable as possible/control as much pain as possible" (82%). "Completely eliminating patient pain" was cited as a goal by only 3% of subjects while "Medicating in accordance with physician’s orders" was cited as a goal by 2% of subjects responding to the free
<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency of &quot;Yes&quot; Responses</th>
<th>Percentage of &quot;Yes&quot; Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you encouraged in your institution to pursue pain management strategies other than medication?</td>
<td>83/148</td>
<td>56%</td>
</tr>
<tr>
<td>Are you encouraged in your institution to consult others regarding your narcotic analgesic administration decisions?</td>
<td>90/146</td>
<td>62%</td>
</tr>
<tr>
<td>Do you feel there is adequate priority placed on pain management in your institution?</td>
<td>92/144</td>
<td>63%</td>
</tr>
<tr>
<td>Do you believe all patient pain can be eliminated?</td>
<td>22/146</td>
<td>15%</td>
</tr>
<tr>
<td>Do you feel that narcotic analgesic administration practices at your institution are adequate?</td>
<td>98/145</td>
<td>68%</td>
</tr>
</tbody>
</table>
response questions.

Consultation practices. Analysis of "yes/no" responses indicated that a majority of subjects believed they were encouraged to consult others regarding their pain management decisions. Analysis of subjects' written responses indicated that 50% of subjects cited "fellow nurses" as a source of consultation. "Physicians" were cited as sources of consultation by 28% of respondents while "pharmacy" was cited by 22%. "Experts in pain management", namely, anaesthetists and palliative care, were cited as sources by 18% of subjects who provided written responses.

Criticisms of institutional pain management. Of those subjects responding to the free response questions, 15% indicated clear dissatisfaction with aspects of pain management practice in their institutions. The most common complaint was with regard to "physician’s inflexibility/unavailability/tendency to undermedicate". Criticisms of this type were cited by 28% of subjects responding to the free response questions. Other criticisms were far less frequently cited and included: "nurses underadminister narcotic analgesia" (5%), "nurses are too concerned with addiction/the possibility of patient manipulation" (4%), and "staffing/amount of time to complete duties is inadequate" (4%).

Methods of improving pain management systems. Of nurses providing written responses, 37% expressed satisfaction with their "knowledge of alternative pain management strategies" and
encouraged their continued or increased use. Thirty-five percent indicated approval of "continuing education efforts in pain management for all hospital staff" while 31% were in favour of "new technologies (particularly P.C.A.) to manage pain".

The validity of the quantitative approach. Results of the analysis of nurses' written responses were supportive of results of the analysis of quantitative data. Nurses' written responses supported the validity of the quantitative approach utilized in this research. Concern was expressed by 2% of the sample regarding the inappropriateness of using an I.M. injection for pain with the patient in the vignette. While I.M. injections are not considered currently to be the best modality in which to deliver analgesia, the practice continues to be commonplace (Donovan, Dillon & McGuire, 1987). In their study of the incidence of pain in medical-surgical inpatients, Donovan et al. (1987) noted, "Analgesics were prescribed p.r.n. and administered i.m. for most of [the] patients [in this study]." (p. 75). In any event, however, the frequency with which this concern was expressed is not considered high enough to constitute a threat to the validity of the quantitative approach.

No subjects reported that alternative methods of managing pain were preferred over more traditional analgesic methods. Even in those settings where the use of alternative methods was strongly encouraged, analgesic administration was considered the primary approach in managing patient pain. This result provides evidence supporting the focus on narcotic analgesic
administration in the quantitative study.
Discussion

The present study investigated the utility of Ajzen's (1991) Theory of Planned Behaviour in predicting nurses' intentions to administer morphine for post-operative pain. The objectives included determining the determinants of behavioural intentions to administer morphine for post-operative pain. Further tests of the Theory of Planned Behaviour were conducted and included an examination of control beliefs and their relationship with perceived behavioural control as well as an examination of the Pain Beliefs Questionnaire (Jurgens, 1995), a general instrument assessing pain beliefs, in the context of the Theory of Planned Behaviour.

The Theory of Planned Behaviour.

In general, results of the present study provide support for the utility of the Theory of Planned Behaviour in the prediction of nurses' intentions to administer morphine post-operatively for pain. The multiple regression of behavioural intention on attitude toward the behaviour, subjective norm and perceived behavioural control was highly significant. Over 50% of the variance in behavioural intention was accounted for by these variables. Attitude toward the behaviour and perceived behavioural control emerged as independent predictors of the behavioural intention, with subjective norm failing to make an independent contribution.

These results are consistent with the findings of numerous
published reports using the Theory of Planned Behaviour. Numerous articles have reported that attitude toward the behaviour, subjective norm and perceived behavioural control accounted for a highly significant proportion of variance in the behavioural intention (Ajzen & Madden, 1986; Blue, 1995; Doll & Ajzen, 1992; Giles & Cairns, 1995; Godin, Valois & Lepage, 1993; Godin, Valois, Lepage & Desharnais, 1992; Richard, Dedobbeleer, Champagne & Potrin, 1994; Schifter & Ajzen, 1985). The lack of an independent contribution for subjective norm in the prediction of behavioural intention does not pose a threat to the Theory of Planned Behaviour as the relative power of determinants of the behavioural intention depends on the specific behaviour studied. The results of the present study suggest that, with regard to administering morphine for post-operative pain, the attitudes of nurses regarding administering morphine for post-operative pain are the most important known determinants of their intentions, with perceived behavioural control making a lesser but significant contribution.

**The Form of Relationships within the Theory of Planned Behaviour.**

In order to conduct a thorough test of the Theory of Planned Behaviour in the present context, hypotheses regarding the multiplicative nature of control beliefs and hypothesized interactions between perceived behavioural control and the sum of weighted subjective norm and attitude toward the behaviour were tested. Further, hypotheses regarding the power of general
beliefs about pain and its management, as assessed by the Pain Beliefs Questionnaire, were also tested. These results will be considered in turn.

**Interactions and multiplicative composites.** Hypotheses regarding an interaction between perceived behavioural control and the weighted sum of subjective norm and attitude toward the behaviour were presented by Ajzen (1985) in his original presentation of the Theory of Planned Behaviour. This hypothesized interaction has proved difficult to establish as Ajzen, himself, has failed to find evidence for it (Schifter & Ajzen, 1985). In his 1991 presentation of the Theory of Planned Behaviour, Ajzen deleted reference to this interaction from the hypotheses of the model. Nonetheless, this hypothesis remains a logical outgrowth of the theory and empirical failure to find evidence for it does not negate this logic.

In the present study, the vignette was designed to create a situation where administration of morphine for post-operative pain was desirable. The vignette was clear in indicating that the previous dose of morphine had been insufficient to manage the patient’s pain, that there were no medical contraindications to administering morphine and that the patient, herself, was willing to take morphine for pain. These elements of the vignette likely maximized nurses’ feelings of behavioural control over the situation. If there had been the possibility of medical complications arising out of administering morphine or if there was a significant possibility that the patient would refuse her
medication, perceived behavioural control might have been comparatively less. The fact that nurses likely experienced a high degree of behavioural control in the situation reduces the possibility of finding an interaction. If very few or none of the subjects experienced low perceived behavioural control, an additive model of attitude toward the behaviour, subjective norm and perceived behavioural control in the prediction of the behavioural intention would be most likely.

McClelland and Judd (1993), in their consideration of the problem of detecting interactions, suggest that field studies are at a decided disadvantage relative to experimental studies. They argue that, in field studies, the residual variance of the interaction term ($PBC \times (\omega_{ATT} + \omega_{SUBNORM})$) is low in field studies as compared to experimental research. This is due to the tendency for the distributions of the variables to overlap. In experimental studies, conversely, values of variables tend to be more extreme, resulting in larger residual variances for the interaction term.

A literature review by Terborg (1977) supports the contentions of McClelland and Judd (1993). Terborg (1977) found clear evidence for an interaction of motivation and ability, in only two of twelve studies reviewed, both of these being experimental studies. The interaction of motivation and ability is not dissimilar to the interaction of perceived behavioural control with attitude towards the behaviour and subjective norm.

In the present study, results support an additive model of
the prediction of behavioural intention from the attitude toward the behaviour, subjective norm and perceived behavioural control. This result is not surprising in the context of the above discussion. That is, given the problems in the detection of interactions in field research and characteristics of the vignette which maximized perceived behavioural control, the failure to find evidence for an interaction between perceived behavioural control and the weighted total of attitude toward the behaviour and subjective norm in the present context is not unexpected.

The review of problems associated with finding evidence for interactions in field research and the failure of the current study to find evidence for the above interaction points out the importance of conducting further study into this problem using experimental designs. Evidence for the existence of the interaction has been mixed. Bates (1995) in a field study which applied the Theory of Planned Behaviour to the prediction of "environmentally conscious behaviours" in a sample of university undergraduates in an explicit attempt to establish the existence of this interaction, reported a failure to find evidence for the interaction. The relationship between perceived behavioural control, attitude toward the behaviour and subjective norm in the prediction of behavioural intention remains unclear, at this point. Future research might re-examine the issue of interactions within the Theory of Planned Behaviour using experimental designs which, according to McClelland and Judd
(1993), are more powerful in detecting interaction effects.

**Control beliefs and their importance.** The Theory of Planned Behaviour proposes that beliefs and evaluations combine multiplicatively to produce the theoretical determinants of attitude toward the behaviour, subjective norm and perceived behavioural control. The criticisms of Evans (1991) and Hewstone and Young (1988), raised above, have equal application to this question. That is, the traditional approach to examining the relationship between theoretical determinants and directly assessed measures of intention has been to examine the correlations between them. Evans (1991) and Hewstone and Young (1988), as noted above, encourage the use of hierarchical regression analysis.

In the current investigation, control beliefs and the importance of control beliefs were found to best combine additively in the prediction of perceived behavioural control. That is, the entry of the multiplicative composite into the multiple regression analysis failed to produce a significant increment in variance accounted for in perceived behavioural control over and above that accounted for by the linear effects of control beliefs and their importance. The results of the present study suggest that a multiplicative model may not be most appropriate in combining control beliefs and beliefs about their importance to arrive at the best determinant of perceived behavioural control. The range of correlations between specific control factors and directly assessed perceived behavioural
control ($r = .0229$ to $r = .3685$) is difficult to interpret. The average correlation between control beliefs and their perceived importance is $0.1415$ and is considerably lower than similar correlations reported in the literature. Although Ajzen (1991) reported correlations between the determinants of intention and their theoretical determinants to be in the $0.4$ to $0.8$ range, Valois et al. (1993) obtained correlations between perceived behavioural control and its theoretical determinants to be in the range of $0.27$ to $0.34$. Although, as noted above, correlations are somewhat difficult to interpret in "expectancy-value" models, the above result can be interpreted as consistent with previous research. Future research should focus explicitly on determining the nature of relationships between perceived behavioural control and its determinants.

The Pain Beliefs Questionnaire.

The Pain Beliefs Questionnaire (Jurgens, 1995) is an inventory of beliefs about pain and its management. Three studies investigating the reliability of the Pain Beliefs Questionnaire (see the Preliminary Study) (see also Study A - Pilot and Study A presented in Appendix I) found coefficient alpha values of $0.70$ ($n = 24$), $0.83$ ($n = 57$) and $0.83$ ($n = 145$). These values are considered acceptable and reflect adequate internal consistency for the Pain Beliefs Questionnaire.

In the current study, the Pain Beliefs Questionnaire was operationalized within the Theory of Planned Behaviour as an
"external variable". That is, as an external variable, Pain Beliefs Questionnaire scores were hypothesized to have only indirect effects on behavioural intention, mediated by more proximal cognitive variables. In a study of health attitudes and behaviour, Ajzen and Timko (1986) found some evidence for this type of relationship between general and specific measures of attitudes. They found nonsignificant correlations between general health attitudes and specific behaviour while specific attitude/specific behaviour correlations were high. Due to their application of an "inappropriate" statistical technique (Evans, 1991), however, strong evidence for the mediation of general attitudes by more specific attitudes was not presented.

In the current investigation, hierarchical multiple regression analysis was used to test for the above mediation effect. It was observed that the variance accounted for in behavioural intention by Pain Beliefs Questionnaire scores was substantially reduced when attitude toward the behaviour was entered on the previous step. However, given the absence of established criteria with which to assess the reduction in variance accounted for, this result is difficult to interpret. It is clear that evidence for some degree of mediation of Pain Beliefs Questionnaire scores by attitude toward the behaviour has been found in that controlling for attitude toward the behaviour reduced the relationship between Pain Beliefs Questionnaire scores and the behavioural intention to nonsignificance.

The above result is considered to constitute strong support
for the Theory of Planned Behaviour. The Pain Beliefs Questionnaire was shown to have a modest relationship with the behavioural intention which is consistent with the theory. This relationship was observed to be sharply attenuated when attitude toward the behaviour was controlled for. It can be stated then, that the effects of Pain Beliefs Questionnaire scores are mediated by model components more proximal to behavioural intention.

It is interesting that Pain Beliefs Questionnaire scores were unrelated to subjective norm and perceived behavioural control. It may be that items on the Pain Beliefs Questionnaire are most like attitudes reflected in the attitude toward the behaviour component of the Theory of Reasoned Action. Given that attitude toward the behaviour accounted for the highest proportion of variance in behavioural intention, it is conceivable that a general measure of similar beliefs would be related to behavioural intention in a similar fashion, although with a smaller magnitude.

Interpretation of Nurses’ Written Responses.

Interpretation of nurses’ written responses indicated that, in general, nurses are pleased with the priority placed on pain management in their institutions and on pain management practices enacted in their workplace. They also indicated that, in general, they are encouraged to pursue alternative, non-medicinal approaches to pain management and that consultation with others
around pain management issues is encouraged. Somewhat surprisingly, nurses in this sample clearly indicated their belief that not all patient pain can be eliminated. Melzack (1990) and others (Cleeland et. al, 1986; Foley, 1979) have argued that no patient need suffer post-operative pain, given advanced, modern methods of pain management.

In the present sample, certain of the nurses’ free responses may help to explain this finding. For example, 15% of respondents indicated their opinion that newer technology (e.g., PCA) has not been well integrated into institutional pain management policy. As well, the tendency for physicians to write inadequate analgesic prescriptions for patients was cited by 19% of respondents. A characteristic response of this type was provide by one nurse who wrote, "We could be doing a lot better with some of our patients but it’s difficult to get these older doctors on side." Fifteen percent of respondents indicated that further education of nurses might increase the efficacy of pain management while 13% recommended continuing education in pain management for physicians. Interestingly, only 3% of respondents suggested that staffing levels needed to be increased to improve pain management. Also, somewhat contradicting the hypotheses of McCaffery (1979, 1981), only 4% of respondents indicated concern that patients may be addicted to narcotic analgesics or may be using their pain complaints to manipulate nursing staff for attention. Ten percent of respondents indicated concern about the tendency for patients to experience the side effect of nausea
with larger doses of narcotic analgesia, particularly morphine. McCaffery (1979, 1981) has suggested that adherence to these types of beliefs may interfere with adequate pain management. Interestingly, however, nurses’ written responses did not include a large number of these types of beliefs.

Research Limitations.

The present study is limited by the fact that intentions to administer morphine for post-operative pain were assessed but the behaviours themselves were not. This limits interpretation of the results in that Ajzen (1991) has argued that many factors may interfere between intention and the performance of the behaviour. This limitation disallows drawing of conclusions about what nurses would do in circumstances similar to those presented in the subject materials and can only speak to what nurses say they would do. Inferences regarding how much analgesia might be administered to actual patients and how much pain might subsequently be suffered by actual patients are unwarranted, given the limitations of the current study.

The present study is also limited in its ability to explain the problem of undermedication of post-operative pain patients due to the fact that it employed a correlational, as opposed to an experimental, design. Further, nurses, and not physicians, patients or others, were the only sample studied. A more thorough understanding of pain management processes would be facilitated by the study of physicians and patients and their
role in this process.

The lower than anticipated internal reliability of the scale to assess behavioural intention (coeff. alpha = .69 - see Table 2) has the effect of placing an upper limit on the magnitude of relationships between intention and its determinants. Modifying the scale to assess behavioural intention so as to achieve a higher internal reliability would likely give a more reliable picture of the relationships between intention and its determinants.

The sample of individuals employed in the current study also limits the generalizability of the findings. That is, subjects in this research were volunteers and it may be that, as volunteers, they possessed characteristics which are unique to them. Further, the research sample, although broadly based (nurses from fourteen hospitals in Saskatchewan participated), was not random. Although these are valid criticisms of the methodology employed in the current study, it is considered unlikely that generalizability was significantly reduced as a result.

The focus of this study, nurses' intentions to administer morphine for pain post-operatively, also limit generalizability. Results of this study have implications only for the situation described to study participants. Results may not be generalized to other samples of health practitioners, other patient populations or other analgesic medications. These situations
must be studied separately, although the methodology need not be altered.

Finally, the fact that the current investigation was a field study limits its effectiveness in testing for interactions within the Theory of Planned Behaviour (Hewstone & Young, 1988). Also, Pedhazur (1982) has warned that error is increased in field research due to the high likelihood of strong correlations between variables studied and variables not assessed as part of the research project. These problems limit interpretation of the study results.

In sum, the limitations listed have implications both theoretically and practically. However, it seems unlikely that the decisions made by study participants are systematically different than those that would be made by other nurses experienced in the post-operative care of abdominal surgery patients. Therefore, it is considered most likely that the present study has constituted a fair test of the applicability of the Theory of Planned Behaviour to nurses’ intentions to administer morphine for post-operative pain.

**Applied Implications.**

Applied implications arising out of the present study derive from both the quantitative and qualitative approaches. One clear implication arising out of the quantitative study is a focus on nurses’ specific attitudes towards administering morphine for pain post-operatively. That is, as attitude toward the behaviour
was the component having the strongest independent relationship with behavioural intention, efforts at affecting the pain management practices of nurses might reasonably focus on this variable. Numerous authors have written about nurses’, and other health professionals’, lack of knowledge regarding narcotic analgesia (Charap, 1978; McCaffery, 1979), negative attitudes (Charap, 1978; Cleeland et al., 1986; Elliot & Elliot, 1992) and fear of addiction when using narcotic analgesia (McCaffery, 1979). To the extent that subjects in this study characterized the administration of the maximum dose of morphine at the shortest possible interval for pain post-operatively as "bad", "unhelpful" or "foolish", lack of knowledge and similar problems might be contributory.

The written responses help to understand the above phenomenon. Although cited by few of the nurses, there were subjects who indicated that some nurses give less morphine to their patients over time due to fears of complications arising out of the morphine administration or of patient addiction or manipulation. These results echo concerns of McCaffery (1979) and beliefs of this nature are at the core of the Pain Beliefs Questionnaire. The present finding that attitude toward the behaviour is most predictive of behavioural intention supports the approach of McCaffery (1979). McCaffery, in her pain management workshops, attempts to debunk myths about narcotic analgesia and to improve attitudes towards pain management. If attitudes toward the behaviour are most important, there are also
implications for nurse education. Efforts should be directed at making student nurses aware of their attitudes towards pain management and potential effects of these attitudes on their practice and, ultimately, perhaps, on the pain experienced by their patients.

Future research might focus on a clearer understanding of the relationships between these variables. For now, however, educational efforts might focus more on the benefits of narcotic analgesic administration for pain, rather than almost exclusively on the possible negative outcomes (Elliot & Elliot, 1992; Harcus, Smith & Whittle, 1977; Zalon, 1995).

Some focus on the role of perceived behavioural control in nurses' decisions to administer morphine post-operatively for pain is also warranted. A high degree of perceived behavioural control was associated with an intention to administer a higher dose of morphine at a shorter interval to the patient in the vignette. To the extent that nurses feel less control over the administration of morphine, their intentions to increase the dosage or frequency of morphine administrations were less.

The ways in which nurses experience an absence of control in pain management may be illuminated by a consideration of their written responses. Fully 28% of subjects who provided written responses indicated some frustration with their relationships with physicians. Anecdotally, the researcher noted similar sentiments expressed by nurses who attended the in-hospital presentations regarding the research study. Nurses' written
responses regarding nurse/physician relationships may provide some insight into some nurses' feelings of lack of control over analgesic administration practices, without making too much of either the relatively low proportion of variance in behavioural intention accounted for by perceived behavioural control or the relatively low rate of expressed concern about nurse/physician relationships. Future research should focus on a clearer representation of these relationships.

Applied implications are also apparent in the analysis of nurses' written responses. Of particular interest in this regard was the finding that only 3% of subjects cited "eliminating pain" as their goal in pain management, whereas an overwhelming 82% ascribed to a goal of "making the patient as comfortable as possible". This result is the same as that reported by Cohen (1980). In his study, Cohen (1980) found that 3% of his sample had a goal of eliminating patient pain and only 8% indicated that they would administer the prescribed narcotic analgesia at the shortest interval allowed for by the prescription order. Sixty-eight percent indicated that they would wait for the patient to request analgesia. This is somewhat surprising, given the large number of published reports which suggest that pain can be virtually eliminated in patients without significant risk of complications (Keerl-Szanto & Heaman, 1972; McCaffery, 1979; Melzack, 1990). Currently, a more preventive approach to pain management is encouraged over traditional p.r.n. prescriptions (McCaffery, 1979; Melzack, 1990) which often require the patient
to request pain medication, resulting in less than optimal pain control.

The above result sharply contrasts with findings of Winefield, Katsikitis, Hart and Rounsefell (1990) who, in a study of patient, physician and nurse attitudes, found that a goal of "total pain relief" was adhered to by 32% of nurses in their sample. There would appear to be great variability in the goals of nurses regarding pain management. Despite the longstanding awareness in the nursing literature that pain management methods exist which virtually eliminate patient pain, most nurses in the current sample appear to be of the belief that the elimination of pain is not possible and a certain number of these appear to believe that elimination of pain is not even particularly desirable. One nurse commented that "pain is necessary to remind the patient of his limitations in recovery".

Another applied implication arising out of the analysis of nurses' written responses was some concern about the nature of the relationship between physicians and nurses. In the presentation to potential nurse subjects in which the present study was described, the researcher observed nurses indicating dissatisfaction with the "inflexibility" of certain physicians. This observation was borne out in subjects' written responses. Twenty-eight percent of subjects who responded to the free response questions expressed frustration with physicians' "inflexibility, unavailability or tendency to undermedicate patients" and 13% explicitly recommended further education in
pain management for physicians. Only a single subject indicated that formalized multidisciplinary meetings focused on pain management were a part of institutional routine. A conclusion derived from these results is that efforts to improve communication between physicians and nurses would likely reduce the frustration detected in nurses in this study and is also likely to result in a higher degree of pain control for patients. Nurses indicated a willingness to consult more frequently with physicians and in a more formalized fashion. Over 50% of nurses indicated that they consulted with colleagues regarding pain management although only 27% cited, specifically, consultation with the physician.

A final applied implication arises out of an examination of the correlations of specific control beliefs and their perceived importance with the behavioural intention. The most important aspect of this analysis was that nurses indicated that the amount of time they have to complete their duties was likely to affect the difficulty of administering the next dose of morphine I.M. at the shortest allowable interval. The result also indicated that nurses' knowledge of narcotic analgesics, their past pain experiences and the adequacy of past documentation were unlikely to affect the difficulty associated with either of the behaviours constituting the behavioural category. Finally, the amount of time nurses have to complete their duties, their own past pain experiences, and the adequacy of documentation were unimportant factors in their decision to administer the maximum dose of
morphine I.M. allowed for by the prescription. The above findings are interesting and help to describe the relevant control beliefs of the sample. Of particular interest is the finding that the amount of time nurses have to complete their duties may occasionally interfere with the administration of the next dose of morphine in the shortest allowable interval. This factor was considered unimportant in nurses' decisions to administer the maximum dose of morphine I.M. allowed for by the prescription.

Further research, perhaps addressing these control beliefs specifically might lead to improved knowledge of their role in pain management decisions. Despite the fact that each of the above beliefs exhibits a small relationship with behavioural intention on its own, the finding of significant relationships between them and the behavioural intention is interesting and bears further investigation.

**Future Directions.**

It is clear from the quantitative results presented that the Theory of Planned Behaviour has utility in predicting nurses' post-operative morphine administration decisions. Although not all relationships were of the form predicted by the model, variance accounted for in behavioural intention was highly significant. As noted above, in order to determine more exactly the exact form of relationships within the model, future researchers should conduct experimental studies. Experimental
studies also have the benefit of providing potential explanations for psychological phenomena rather than simply predicting individuals' performance (Pedhazur, 1982). In experimental studies, independent variables can be manipulated and the causal relationship between predictor and criterion may be determined.

Another possible future direction involves analyzing the constructs in the Theory of Planned Behaviour using other statistical techniques which allow for reciprocal effects. Lisrel is an example of a statistical technique that allows for this sort of analysis. It is conceivable that a simple unidirectional model such as the Theory of Planned Behaviour is inadequate to predict the formation of behavioural intentions without testing for reciprocal effects, although how these effects would be specified is, as yet, unclear. In order to test for reciprocal effects, however, a theory predicting such effects is required as the assumptions of these statistical techniques are rigid.

Future research should also consider the relationships between model components in other populations. Physicians and patients are obvious populations in which these processes could be studied. Indeed, in order to understand fully the problems inherent in pain management, the study of physicians and patients is essential.

A study similar to that conducted here but which seeks to specify the theoretical determinants of attitude toward the behaviour is suggested, given the present findings. Attitude
toward the behaviour emerged as the most important single predictor of the behavioural intention and, as such, a better understanding of how this attitude may be formed would increase our knowledge of the determinants of nurses' intentions. Knowledge of the theoretical determinants of attitude toward the behaviour would also have practical implications and could inform educational efforts with student nurses as well as continuing education efforts with practicing professionals.

Finally, further research into the utility of the Pain Beliefs Questionnaire is suggested and warranted, given the results of the present study. Pain Beliefs Questionnaire scores accounted for a 1% increment in variance accounted for in behavioural intention over and above all other predictors, this proportion of variance being nearly significant ($p = .08$). As a very general measure of beliefs about pain and its management, this degree of relatedness to behavioural intention is noteworthy. Further research should be conducted to determine whether the Pain Beliefs Questionnaire might have utility in training or assessment of nurses. Revisions to the questionnaire might allow for assessment of beliefs in somewhat more specific situations which might improve the predictive importance of the instrument.

**Conclusion.**

The results of the present investigation generally support the utility of the Theory of Planned behaviour in predicting
nurses’ intentions to administer morphine for pain post-operatively. A large proportion of variance in behavioural intention was accounted for by model components. Both attitude toward the behaviour and perceived behavioural control made independent contributions to the prediction of behavioural intention.

The Theory of Planned Behaviour fared less well when hypotheses regarding interactions of model components were addressed. No support for an interaction between perceived behavioural control and the sum of weighted subjective norm and attitude toward the behaviour in the prediction of behavioural intention was found. Further, no evidence to support the multiplication of control beliefs by their perceived importance in the prediction of directly-assessed perceived behavioural control was found. Control beliefs and their importance combined additively to predict directly-assessed perceived behavioural control. Taken together, these results suggest that the exact form of relationships between components of the Theory of Planned Behaviour has yet to be adequately specified, especially when applied in the context of field research. Future studies should focus on experimental designs which have greater importance in detecting interactions and have the further ability to isolate directions of causality within the model.
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Appendix I

Study A -

Pain Beliefs and the

Analgesic Administration Practices of Nurses

by

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July 1995
Abstract

Two hypotheses to predict the narcotic analgesic administration practices of nurses were investigated. The first, derived from the work of McCaffery (1979), holds that nurses' adherence to "myths" about pain, in which the nurse holds beliefs about pain and its management considered to be "erroneous", predict nurses' narcotic analgesic administration behaviours. Nurses' narcotic analgesic administration behaviours were expected to predict patient pain. The second, derived from work by Charap (1978), holds that nurses' perceptions of their nursing supervisor's preferences as regards narcotic analgesic administration are more important than their own beliefs about pain in the prediction of pain management practices and the amount of pain experienced by patients. Nurses' reports of their supervisors' opinions were hypothesized to predict nurses' intentions to administer narcotic analgesia, which, in turn, was thought to predict nurses' narcotic analgesic administration behaviours. As above, narcotic analgesic administration behaviours were hypothesized to predict patient pain.

A 50-item Pain Beliefs Questionnaire was piloted with a sample of 57 third-year nursing students (Study A - Pilot). Psychometric analyses were carried out and demonstrated that optimal and adequate test-retest reliability and internal consistency were demonstrated by a 22-item version and this version was used in the main study which followed.

In the main study (Study A) hospital patients' pain was
assessed using the short form of the McGill Pain Questionnaire (MPQ) (Melzack, 1987) on their second post-operative day. Measures of narcotic analgesic administration behaviours failed to predict patient pain. As regards Charap’s (1978) model, the perception of the nursing supervisor’s opinion was not a better predictor of pain management behaviour or patient pain than nurses’ own pain beliefs. Methodological issues related to this finding are discussed. Intentions were significantly predicted by the nursing supervisor’s opinion. However, relationships between nurses’ intentions and their narcotic analgesic administration behaviours were nonsignificant. Variables preceding nurses’ intentions in the model, as well, demonstrated nonsignificant relationships with narcotic analgesic administration behaviours or patient pain.

As regards McCaffery’s (1979) model, Pain Beliefs Questionnaire scores were unrelated to narcotic analgesic administration behaviours although the PBQ demonstrated a marginally significant partial correlation, controlling for social desirability in responding, with one index of patient pain derived from the McGill Pain Questionnaire. In sum, the main hypotheses of Study A were largely unsupported.

The incidence of post-operative pain in the patient sample was described. The reliability of the Pain Beliefs Questionnaire in the studies was discussed. Design and statistical issues related to a smaller than anticipated sample size were considered. Further research in the area was suggested.
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PAIN BELIEFS AND THE
ANALGESIC ADMINISTRATION PRACTICES OF NURSES

Note: The discussion of the incidence and characteristics of pain in the post-operative population (pp. 1-3) introduces the following section as well and is not repeated here.

Introduction

Explanations for the Undermedication of Patient’s Post-operative Pain.

Qualitative research by Hunt (1992) illustrates the complexity of pain management. Hunt (1992) describes three core categories of the decision making process for nurses in the management of pain. The first of these, a category entitled "deciding", has the most relevance to the current discussion and includes nurse variables, physician variables, family variables and patient variables. Nurse variables include values and goals, knowledge of pain management practices and alternatives, life experiences and the relationship with the patient. Patient variables include the stage of a terminal illness with which the patient may be suffering, values and goals, the diagnosis, verbal and nonverbal pain cues expressed by the patient, characteristics of the patient and knowledge of pain management. Physician variables were found to include collegiality, values and goals and knowledge about pain and its management. Family variables include characteristics of the patient’s family and the knowledge of the family. Given that the above variables interact with each other in each pain management case, Hunt’s (1992) research demonstrates that the problem of pain management is, indeed,
complex and multifaceted. The current research investigated nurse variables related to decisions to administer narcotic analgesia. The specific variables which were addressed in the current study will be considered in the section following.

Other researchers have focussed on variables related to either the patient or the nurse. That is, the decision process entered into by the nurse considering the administration of analgesic medication is a function of the way the patient is presenting as well as the way that particular nurse tends to interpret such cues. The contributions of researchers investigating patient variables and nurse variables related to the decision to administer analgesic medication will be considered in turn below.

Nurse Variables Related to the Administration of Analgesic Medication.

A number of variables associated with nurses have been investigated and may be related to nurses’ analgesic administration decisions. McCaffery (1983) has suggested, for example, that a nurse who adheres strongly to a scientific orientation might consider pain to be only a symptom. McCaffery (1983) argues that the scientific tradition in medicine holds that the causes of disease should be investigated and treated so that the symptoms may be alleviated. She suggests then, that pain, as a symptom, may receive less than adequate attention from a nurse with a strong scientific orientation.
Davitz and Davitz (1980, 1981) have examined the tendency of nurses to infer high or low degrees of suffering in their patients. Nurses who inferred a high degree of suffering were found to attend more to the physical needs of the patient than nurses who inferred a low degree of suffering. Nurses who tended to infer higher degrees of suffering were observed, for example, to touch their patients more and to attend more closely to the psychological variables of distress and anxiety. Nurses who tended to infer less suffering were observed to involve themselves in more room straightening behaviour and were noted to maintain a greater physical distance between themselves and their patients. The nurses’ intention to administer analgesic medication was not assessed but a relationship between the tendency to infer more or less suffering and the tendency to medicate seems likely.

Davitz and Davitz (1980, 1981) also found other nurse variables, including the nurses’ experience, to be related to inferences of suffering. That is, over the course of their first year of formal training, nurses were found to significantly reduce the amount of physical pain they inferred in pain patients. Also, it was found that nurses’ tendency to infer suffering in pain patients was positively correlated with the number of painful experiences they reported from their own lives. Finally, as was the case with the cultural background of the pain patients, nurses’ tendencies to infer pain in others varied as a function of the nurses’ cultural background. Nurses from Eastern
cultures such as Korea, Japan and India inferred the highest degrees of pain while Western nurses from England, the United States and Belgium were found to infer the lowest degrees of suffering.

Charap (1978) has suggested the possibility that, while the above nurse variables may be related to inferences of suffering, actual medication practices may be more affected by the nurses’ perception of what his/her supervisor feels would be effective pain management. Charap (1978), then, appears to be suggesting that the nurses’ perception of the wishes of the nursing supervisor will be strongly related to the nurses’ actual tendency to administer more or less analgesic medication.

The studies of Davitz and Davitz (1980, 1981) have made an important contribution to our understanding of variables which may affect nursing practice. However, Davitz and Davitz (1980, 1981) have failed to explicitly address whether such variables are actually related to nursing practice. That is, the authors might have investigated whether the variables considered above are demonstrably related to, for example, a nurse’s actual tendency to administer analgesic medication as opposed to being related to his/her tendency to infer suffering. While we might expect inferences of suffering to be related to the nurses’ tendency to medicate for pain, this question has not been explicitly addressed.

The current research proposes to assess directly the relevance of two nurse variables, their beliefs about pain and
their perception of their supervisor's opinion regarding how pain ought to be managed, to one aspect of their actual nursing practice, the administration of analgesic medication to patients who are experiencing post-operative pain.

The Role of Nurses' Beliefs, Attitudes and Knowledge in their Pain Management Decisions.

A number of investigators have examined nurses' beliefs, attitudes and knowledge about pain and its management. These constructs are considered together in this section due to the tendency for them to be confounded in the literature. Indeed, Ajzen and Fishbein (1980) note that "many practitioners and laymen have tended to view attitudes as a complex of feelings, beliefs, motivations, perceptions, and intentions" (p. 55). With regard to the nursing literature, this problem is exacerbated by the debate in nursing circles regarding the knowledge base. That is, it would appear that one nurses' "fact" is another's "myth" or "belief". Indeed, regardless of how the constructs of knowledge, attitude and belief are operationalized, the principle underlying much of the research would appear to be that adherence to erroneous "facts, beliefs or attitudes", indeed, "myths", interfere with adequate pain management practices.

In a study investigating nurses' knowledge of pain control, Hamilton and Edgar (1992) found knowledge deficiencies in their sample of nurses. The authors reported that nurses misunderstood principles of addiction to narcotic analgesia, ceiling effects,
equivalent dosing and the risk of respiratory depression. Similarly, McCaffery and her colleagues (McCaffery, Ferrell, O’Neil-Page and Lester, 1990) in a sample of pain management workshop attenders found that nurses "grossly overestimated" the risk of addiction with narcotic analgesia. These researchers found that 75% of respondents estimated the likelihood of addiction with narcotic analgesia to be over 1%, an overestimate by a factor of at least 100 (McCaffery et al, 1990). However, education was found to ameliorate this effect with fewer nurses attending advanced workshops overestimating the risk of addiction as compared to nurses attending the first, basic workshop.

Winefield, Katsikitis, Hart and Rounsefell (1990) in a study of patient, physician and nurse attitudes, found that "p.r.n." was defined by nurses in their study as meaning "after the patient requests medication" rather than "as needed", the definition of p.r.n. used by these authors. However, only one-third of their sample of patients asked for analgesia when their pain returned. A goal of "total pain relief" was adhered to by 32% of nurses and 18% of physicians in their sample. Physicians were found to have more fear of respiratory depression than nurses while interns rated the likelihood of addiction to be higher than senior physicians. The authors note that, since junior physicians in that setting were more likely to be involved in writing analgesic prescriptions than senior physicians, these prescriptions would likely involve lower dosages of narcotic analgesia at longer intervals than would be ideal from the
standpoint of optimal pain relief.

In a study of attitudes regarding post-operative opioid analgesia with a sample of physicians and nurse, Lavies, Hart, Rounsefell and Runciman (1992) found that 54% of their sample of nurses felt that their education in pain control was adequate, compared to only 18% of physicians. Physicians were found to have higher estimates of the risk of respiratory depression and addiction than nurses. Nurses were less satisfied than physicians with the quality of pain control for patients at the hospital and 67% of nurses believed that analgesia was under-prescribed.

In a study of the level of knowledge among baccalaureate nursing students, Sheehan, Webb, Bower and Einsporn (1992) found their subjects to possess inaccurate knowledge of concepts such as when to administer the maximum analgesic allowable by the prescription, whether increasing patient pain is related to tolerance of narcotic analgesia or disease progression, the preferred route of analgesic administration (parenteral or oral) and the degree of risk of respiratory depression with repeated narcotic analgesic administration. An explanation for this finding may be provided by Ferrell and her colleagues (Ferrell, McCaffery & Rhiner, 1992) who reviewed eight recent pharmacological texts and six medical/surgical texts and found only one to provide a correct definition of opioid addiction and a correct likelihood of addiction to narcotics administered for analgesic purposes. This finding also speaks to the results of
the study of Winefield et al. (1990), presented above, that
junior physicians overestimate the risk of respiratory depression
and addiction with narcotic analgesia relative to senior
physicians.

Other authors have also written of the importance
of nurses’ pain beliefs and attitudes in explaining the
undermedication of patients in pain. Bagley, Falinski, Garnizo
and Hooker (1982) state that "methods of implementation [of pain
management procedures] have often been based upon a spuriously
derived data base which have [sic] been heavily influenced by the
fear of fostering addiction..." (p. 192). Similarly, Harcus,
Smith and Whittle (1977) suggest that;

"because [nurses] seem to have been indoctrinated about
the side effects and addictive effects [of narcotics]
they are reluctant to administer the drug in adequate
amounts. As a result, some patients may suffer
unnecessarily" (p.95).

Finally, Keeri-Szanto and Heaman (1972) have noted that the cause
of undermedication must, necessarily, be the regular
underestimation of the basic requirements of the patient in terms
of pain medication. Keeri-Szanto and Heaman (1972) suggest that
perhaps health professionals feel that the problem of pain
management is too complex, that health professionals are
concerned that the patient may become addicted to the narcotic
analgesic medication, or that the patient may suffer an overdose,
statements reflecting a set of beliefs which a nurse may hold
regarding pain and its management.

Marks and Sachar (1973) suggest that a prescription for a drug with the side-effect of euphoria may cause a "puritanical counter-reaction" (p.181) on the part of health professionals which would significantly reduce the likelihood that adequate doses would be administered for the control of pain.

Finally, adherence to myths about pain has been suggested by McCaffery (1979) to be an important variable in the undermedication of pain in patients. McCaffery (1979) has suggested that nurses’ adherence to myths about pain and pain management precludes the effective management of their patient’s pain and affects the nurses’ behaviour in a variety of pain management contexts. McCaffery (1979) has argued that nurses’ adherence to myths and prejudices about pain does not allow a full awareness of patient suffering. She goes on to outline nursing myths regarding pain which may interfere with optimal pain management. McCaffery’s (1979) work suggests that a researcher ought to assess the pain beliefs of nurses and relate the scores on such an inventory to nurses’ medication choices.

There has, then, been considerable interest in the concept of pain beliefs among nurses as explanatory in the pain management decisions of nurses. The present research assessed nurses’ adherence to beliefs about pain and its management and examined the possibility of predicting nurses’ analgesic administration decisions through knowledge of their adherence to pain myths.
McCaffery's Theory - Adherence to Pain Myths.

Overview of the Theory.

While not proposing an explicit theory, McCaffery (1979) has hypothesized a relationship between the nurses' adherence to myths about pain and the amount of pain subsequently experienced by his/her patients. The logical mechanism through which adherence to myths about pain may have an effect on patient pain is through the specific analgesic administration practices of the nurse. Figure 1 presents a model inferred from McCaffery's (1979) work.

Model variables. In McCaffery's model, the variable most closely related to the amount of pain experienced by patients is the pain management behaviour of the attendant nurse. Pain management behaviour is defined as the specific analgesic administration behaviours of the nurse. The analgesic administration behaviours of nurses are likely among the pain management behaviours enacted by nurses which have the most significant impact on the experience of pain in patients. Further, specific analgesic administration behaviours are relatively simple to operationalize and are considered to be a reasonable starting place for research in an area which has not been extensively studied. All other things being equal, the more analgesia administered and the more frequently it is administered, the less the amount of pain experienced by the patient. Analgesic administration behaviour is defined, therefore, as occurring along these dimensions.
Figure 1

Model of the Relationship Between Nurses’ Pain Beliefs, Nurses’ Pain Management Behaviour and Patient Pain (McCaffery, 1979).
According the McCaffery’s (1979) hypothesis, the specific analgesic administration behaviours of nurses are determined by their beliefs about pain and its management, specifically, according to McCaffery (1979), by their adherence to erroneous beliefs about pain or "pain myths". That is, to the extent to which nurses adhere to pain myths, their specific analgesic administration behaviours will be less than optimal. They will deliver smaller doses of analgesic medication at longer intervals than nurses who do not adhere to pain myths to the same extent.

Pain myths are defined as erroneous beliefs about pain and its management. This definition is complicated, however, by the lack of consensus among nursing authorities regarding what "the facts" are in terms of appropriate narcotic analgesic administration practices. The finding by Ferrell et al. (1992) that nursing texts provide conflicting information regarding risks associated with narcotic analgesia buttresses this comment.

Generally, pain myths reflect a belief on the part of the nurse that he/she knows more about the patient’s pain and how to manage it than does the patient him/herself. McCaffery (1979) has strongly indicated her opinion that the patient is the only expert on his/her pain and has defined pain as "whatever the experiencing person says it is, existing whenever he says it does" (p. 11). McCaffery's definition of "pain myths" is "misconceptions that cause us to doubt the patient’s pain when we already have information from the patient about its existence and characteristics" (p. 10) (McCaffery, 1979). McCaffery (1979)
elaborates this definition;

"These misconceptions involve: (1) who has the authority to judge pain, (2) responses typical of acute pain and adaptation, (3) pain of unknown cause, (4) predictability and variability of the duration and severity of pain, (5) how much pain a patient "should" tolerate, and (6) agreement between patient and staff." (p. 10).

It is considered possible to derive, using the above operational guidelines, an inventory to assess nurses’ adherence to myths about pain.

Finally, the amount of pain experience by the patient is defined as the patient’s response to an inquiry as to the status of their pain. The best indicator of the amount of pain experienced by a person is, according to McCaffery (1979), his/her statements to that effect. Indeed, McCaffery (1979) defines pain itself as whatever the patient says it is.

**Rationale and Objectives.**

McCaffery’s (1979) theory has been derived explicitly to explain the persistent analgesic undermedication of patients in pain. Therefore, testing the theory in a study of pain myths, specific analgesic administration practices and patient pain is considered appropriate.

Specific objectives to be achieved through the utilization of McCaffery’s (1979) theory are 1) to determine if a reliable
inventory of pain myths may be derived, 2) to provide evidence for the predictive validity of an inventory of pain myths by demonstrating a relationship with nurses' specific analgesic administration behaviours and, ultimately, with patient pain, and 3) to test the ability of McCaffery's theory to account for the undermedication of pain patients through assessment of nurses' adherence to pain myths.

**Measurement of Model Components.**

The assessment of patient pain could be made using any one of the pain assessment tools commonly employed by health professionals. These tools commonly involve respondents' ratings of adjectives which describe pain as well as Likert-type and visual analogue scales to rate pain intensity.

Measurement of the specific analgesic administration behaviour of nurses could be made relative to the two dimensions of amount and time interval between administrations. With regard to the amount administered, in order to reflect nurses' decision making processes rather than the limits imposed on the nurse by the physician's prescription order, one could derive an index of the amount of analgesia administered relative to that allowed for by the prescription order. For example, in one instance, the administration of 5 mg. of morphine might represent the least amount of morphine which might be delivered to the patient whereas, in another instance, the same analgesic administration might be the most which the nurse might have delivered given the
limitations of the prescription. Similarly in the case of the interval between analgesic administrations, assessment of this variable could take the form of an index in which the amount of time which elapses between analgesic administrations would be considered relative to the smallest time interval between administrations allowed for by the prescription.

Finally, in order to assess adherence to pain myths, an inventory of myths about pain, derived from McCaffery’s guidelines listed above and with item content contributed from authors in the pain management literature, could be devised and analyzed, deleting items to maximize internal consistency. The direction in which items are scored would be guided by McCaffery’s (1979) characteristics of "misconceptions" about pain such that higher scorers on the inventory would endorse more "pain myths" than lower scorers.

Charap’s Theory – Adherence to the Perceived Wishes of Supervisors.

Overview of the Theory.

As in the case of McCaffery’s theory described above, Charap (1978) has not proposed an explicit theory but, rather, has hypothesized that nurses’ perceptions of their supervisor’s opinion with regard to pain management decisions may be a more important predictor of analgesic administration behaviour than the beliefs of the nurse him/herself. This theory suggests that knowledge of a nurses’ perception of how his/her supervisor would
have him/her behave with regard to pain management will predict the nurses’ analgesic administration behaviour and, ultimately, the amount of pain experienced by patients. This model is depicted in Figure 2.

Charap’s (1978) study investigated the knowledge, attitudes and experience of medical personnel with regard to pain management. In his research, Charap (1978) uncovered an interesting paradox in the responses of subjects in his study. Charap (1978) found that while health professionals felt that p.r.n. orders decreased the likelihood of tolerance and addiction in patients they, at the same time, believed that if drug administrations were regularly scheduled, rather than administered on a "when necessary" basis, the absolute amount of drugs administered would not increase. In order to account for this paradoxical finding, Charap (1978) raised the interesting possibility that health professionals’ personal beliefs about pain and pain management may be less important in their pain management decisions than the preferences of their supervisors. That is, nurses’ medication choices may reflect the wishes of their supervisors and have little or nothing to do with their own beliefs. This nurse variable is worthy of further study.

Ajzen and Fishbein’s (1980) Theory of Reasoned Action could be utilized as the vehicle through which nurses’ perceptions of the wishes of supervisors may be assessed and related to nurses’ medication choices. Ajzen and Fishbein’s (1980) model includes a construct called the subjective norm which is defined as a
Figure 2

Charap's Model of the Relationship Between the Perception of the Supervisor's Opinion and Patient Pain.

Belief that specific referents think the behaviour should or should not be performed

Motivation to comply with these referents

Subjective Norm → Intention → Behaviour
person’s "perception that most people who are important to him think he should or should not perform the behaviour in question" (p. 57). A portion of the Theory of Reasoned Action, then, would be able to test Charap’s (1978) hypothesis that supervisor’s beliefs are more important than the beliefs of individual nurses in predicting medication choices.

Model variables. As in McCaffery’s theory, above, Charap’s theory suggests that the best predictor of the amount of pain experienced by a patient is the specific analgesic administration practices of the attendant nurse. As above, specific analgesic administration behaviours are conceived of as occurring along the two dimensions of the amount of analgesia administered and the interval allowed to elapse between analgesic administrations.

In Charap’s model the temporally closest predictor of specific analgesic administration behaviours would be the nurses’ intention to enact these behaviours in a particular way. Intention is defined by Ajzen and Fishbein (1980) as a measure of the likelihood that a person thinks he/she would engage in a given behaviour.

The subjective norm, defined by Ajzen and Fishbein (1980) as the individual’s perception that most people who are important to him/her think that he/she should or should not perform a particular behaviour, was used as the sole predictor of intention in the present study. Further, the definition of the subjective norm component in the current research was modified so as to involve only the perception that the nurses’ supervisor thinks
that he/she should or should not provide analgesic medication in a particular fashion.

The subjective norm is determined by two constructs, the individual’s belief that important others would recommend/not recommend the performance of a behaviour and the individual’s motivation to comply with each of these referents. In the present study only one referent, the nursing supervisor, was considered. Combining the respondent’s rating of their perception of how their supervisor would have them medicate a patient with their rating of their motivation to comply with their supervisor yielded the subjective norm component of Charap’s model.

In summary, Charap’s Theory was examined using constructs borrowed from Ajzen and Fishbein’s (1980) Theory of Reasoned Action. Like the Theory of Reasoned Action, Charap’s Theory assumes that individuals have conscious control over most of their behaviour and that they can specify the cognitions which lead them to certain volitional decisions.

**Rationale and Objectives.**

Charap’s theory explains the pain medication practices of nurses by proposing that the perception of nurses that their nursing supervisors would have them medicate their patients in a particular way will predict their pain management behaviour. A portion of Ajzen and Fishbein’s (1980) Theory of Reasoned Action has been selected to test this theory as the subjective norm
component of the model closely approximates the "opinion of the nursing supervisor" in Charap's (1982) hypothesis. The components of the Theory of Reasoned Action utilized in the present research have been modified from their original form to better correspond with elements of Charap's model.

**Measurement of Model Components.**

In the present study, as noted above, only a portion of the Theory of Reasoned Action were utilized. Intention was measured as was a modified version of the variables which predict intention; the subjective norm, the normative belief of the nursing supervisor and the motivation to comply with the nursing supervisor. The measurement of these variables was expected to provide a test of Charap's model regarding the analgesic administration practices of nurses.

**Measuring intention.** The Theory of Reasoned Action specifies that intention is the immediate determinant of behaviour and, if measured correctly, should provide the best predictor of behaviour. To measure intention correctly, Ajzen and Fishbein (1980) argue that the level of behavioural specificity among attitudes toward the behaviour, the subjective norm and the intention to perform the behaviour must be equivalent along the dimensions of the action, target, context and time period involved, across the measurement of all constructs within the theory.

Intention might be assessed by asking respondents to rate
the likelihood of engaging in a specific behaviour on a Likert-type scale as illustrated in the example below.

Example: I

would _____:_____:_____:_____:_____:_____:_____ would not

[+3  +2  +1  0  -1  -2  -3]

increase the blood level of pain medication in the patient by increasing the medication dosage, increasing the medication frequency or both.

A person who receives a score of "+3" would be considered to be more likely to perform the behaviour than a person who receives a score of "0" and much more likely than a person who receives a score of "-3".

Measuring the normative beliefs of supervisors and the motivation to comply with supervisors. In order to compute the "subjective norm" component of Charap’s model, one must assess the individual’s belief that his/her nursing supervisor would recommend/not recommend performing specific analgesic administration behaviour and the individual’s motivation to comply with his/her nursing supervisor.

The subjective norm component of the model could be assessed by asking respondents to indicate their perception of how their supervisor would have them medicate their patient and their motivation to comply with their supervisor.
Example:

My nursing supervisor would recommend that I should _____:_____:_____:_____:_____:_____:_____ should not [+3 +2 +1 0 -1 -2 -3]

increase the blood level of pain medication in the patient by increasing the medication dosage, increasing the medication frequency or both.

How much do you want to do what your nursing supervisor thinks you should do?

___ not at all [0]
___ slightly [+1]
___ moderately [+2]
___ strongly [+3]

According to Charap’s theory, the more a nurse thinks that his/her supervisor would recommend the performance of a specific analgesic administration behaviour, the more likely the nurse is to form such an intention.

The Present Study.

In the present study, McCaffery’s and Charap’s models were tested for their utility in predicting nurses’ narcotic analgesic administration decisions. Given the lack of studies designed to explain the persistent tendency for patients to experience unnecessary pain, such an approach is timely and important.
Selecting the research sample. Nurses were selected as the sample of interest in the current research. Bagley and colleagues (1982) have suggested that nurses are the health care professionals with the most control over the management of patient pain. A research approach similar to that proposed here but utilizing physicians as the research sample would likely provide equally useful information regarding how patient pain is managed but was considered beyond the scope of the present investigation. Nurses comprised the sample in both the Study A - Pilot and Study A described below.

The Study A - Pilot.

A pilot study was conducted to establish the internal consistency of a Pain Beliefs Questionnaire utilizing a 50-item list of pain beliefs. Items were deleted to maximize internal consistency and the test-retest reliability of the subset was determined. This subset of items was used in Study A.

Study A.

Post-operative patient subjects were surveyed by a research assistant and completed the short-form McGill Pain Questionnaire (Melzack, 1987) as well as providing general demographic information. When this phase of data collection was completed, a second research assistant administered to nurse subjects the Pain Beliefs Questionnaire, an inventory to assess the constructs of Charap’s Theory, a short demographic questionnaire and the
Edwards Social Desirability Scale (Edwards, 1957). A measure of social desirability in responding was included due to the obviousness of items on the Pain Beliefs Questionnaire and was used as a covariate in analyses involving Pain Beliefs Questionnaire scores. Finally, the first research assistant obtained information regarding the prescription order, the amount of analgesia administered and the interval between analgesic administrations from the patient charts for patients who had consented to participate. Measures collected from each nurse were then related to measures collected from the patient charts and the patients of each nurse.

**Ethical Considerations in the Present Research.**

This section will address ethical considerations in the present research with reference to the *Ethical principles in the conduct of research with human participants* (APA, 1973). Study A - Pilot subjects were fully informed as to the studies purposes. In Study A, however, fully informing the subjects regarding the purposes of the research would likely have invalidated the findings. In such a case the researcher is directed to weigh the potential benefits of the research against the cost to the individual. In this study the potential benefits were great, that is, the potential for patients to suffer considerably less pain while in the care of health professionals. The potential costs to the individual were minimal in that nurse subjects remained anonymous and their pain management practices remained
confidential. This was achieved by identifying nurses by numbers rather than by name in the data and subsequent analysis. Further, this coding was done in a double-blind fashion such that the researcher was unable to relate the pain management practices noted in the data gathering phase with any individual nurse. Patient subjects were also not fully informed with regard to the purposes of the present research but the cost to the individual patient subject was negligible in that they reported only the amount of pain they were suffering and remained anonymous. It was expected that research participants would find it reasonable that they were not fully informed when they were debriefed following their participation.

Research subjects were free to withdraw from the research at any time. There were no foreseeable risks to subjects associated with their participation in this research.

With regard to debriefing, in the Study A - Pilot, subjects were debriefed during a presentation made to nursing student subjects by the researcher. In Study A, nurse participants were debriefed in a face-to-face debriefing session and patient participants were debriefed through the use of a debriefing letter if they indicated that such contact was desired. Patient participants had the opportunity to request debriefing when they provided consent to participate. Research participants had the opportunity to voice any concerns about their participation in the research. In the Study A - Pilot and in Study A, nurse participants had this opportunity during face-to-face debriefing
sessions and patient participants were able to voice concerns through the use of a telephone number provided to them in the written debriefing which was mailed to them.

Definitions

Charap’s model. Intention has not been explicitly defined by Ajzen and Fishbein (1980). The authors state simply that "a person’s intention to perform (or to not perform) a behaviour [is] the immediate determinant of the action" (p. 5). In Charap’s model, intention is predicted by the subjective norm. The subjective norm is defined as the belief that referents would recommend/not recommend the performance of a specific behaviour and is a function of normative beliefs and the motivation to comply with referents. Ajzen and Fishbein (1980) fail to define beliefs explicitly except to state that "a person who believes that performing a given behaviour will lead to mostly positive outcomes will hold a favourable attitude toward performing the behaviour" (p. 7). With regard to the beliefs which predict the subjective norm, the authors state that the beliefs are "of a different kind, namely the person’s beliefs that specific individuals or groups think he should or should not perform the behaviour. These beliefs underlying a person’s subjective norm are termed normative beliefs" (p. 7).

Two indices related to nurses’ administration of a particular dosage of narcotic analgesic at a particular interval are defined by computational formulae described above. Finally,
pain is defined by McCaffery (1979) as "whatever the experiencing person says it is, existing whenever he says it does" (p. 11).

**McCaffery's model.** Pain beliefs are defined as beliefs related to pain and its management. The Pain Beliefs Questionnaire was scored in the direction of adherence to pain myths, defined by McCaffery (1979) as "misconceptions that cause us to doubt the patient’s pain when we already have information from the patient about its existence and characteristics" (p. 10) (McCaffery, 1979).

**Hypotheses**

**The Study A – Pilot.**

A 50-item Pain Beliefs Questionnaire was pretested in the Study A – Pilot (see Appendix I(A) for a copy of the 50-item Pain Beliefs Questionnaire). It was hypothesized that an inventory of acceptable internal consistency could be derived from the 50-item pool employed in the pilot study. The inventory derived from the 50-item Pain Beliefs Questionnaire was utilized in the studies which followed.

The reliability of the Pain Beliefs Questionnaire was assessed through the computation of test-retest reliability scores. Test-retest correlations provided an indication of the reliability of the test. A test of internal consistency (coefficient alpha) provided a measure of the extent to which items on the inventory measured a single construct. Items were deleted from the Pain Beliefs Questionnaire based on an index derived by multiplying the standard deviation of the item by the
item-total correlation (Allen and Yen, 1979). This procedure was completed for multiple versions of the Pain Beliefs Questionnaire and the version retained for use in subsequent studies was the one with the highest coefficient alpha. The combination of high test-retest reliability and a high coefficient alpha provided evidence for the stability of pain beliefs as a construct.

Because the most socially appropriate direction to respond to the majority of inventory items was obvious and nurses may have been motivated to respond in a socially sanctioned, or positive, manner, a measure of social desirability was obtained for each nurse and inventory scores corrected for the social desirability component in their responding. Social desirability scales assess the tendency of respondents to present themselves in a favourable light by presenting them with a list of minor human faults which most people would acknowledge possessing. To the extent that a respondent fails to acknowledge these minor human faults, it is assumed that they would take a similar approach to responding on other inventories. A social desirability score, then, may be used as a covariate and the effect of social desirability in responding can be partialled out of scores on other inventories. Therefore, nurses completed the Edwards Social Desirability Scale (Edwards, 1957) at the same time as they completed the Pain Beliefs Questionnaire. Appendix I(B) contains a copy of Edwards Social Desirability Scale (1957)

Specific hypotheses are grouped according to the variables employed in each analysis.
Study A.

Hypotheses derived from McCaffery's theory. (1) Variables operationalized as reflecting the pain management practices of nurses (the interval between narcotic analgesic administrations and the ratio of analgesic administered relative to that allowed by the prescription order) should significantly predict the pain experienced by patients (as measured by the three indices of the McGill Pain Questionnaire). (2) Scores on the Pain Beliefs Questionnaire should significantly predict variables operationalized as reflecting the pain management practices of nurses. (3) Because of the obvious nature of items in the Pain Beliefs Questionnaire, it is hypothesized that correlations between the Pain Beliefs Questionnaire and indices of nurses' pain management behaviour would be increased by partialling out the effect of social desirability as assessed by Edward's (1957) Social Desirability scale. (4) Scores on the Pain Beliefs Questionnaire should not significantly predict the pain experienced by patients when the effect of variables associated with nurses' pain management practices is partialled out.

Hypotheses derived from Charap's theory. (1) The specific pain management practices of nurses is hypothesized to predict the pain experienced by patients. (2) Intention is hypothesized to significantly predict the actual pain management behaviour of nurses. (3) The subjective norm is hypothesized to predict intention. (4) The correlation between subjective norm and intention should be significantly larger than the correlation
between Pain Beliefs Questionnaire scores and intention.
Method

The Study A - Pilot.

The Pain Beliefs Questionnaire was pretested in the following manner. First, the questionnaire was reviewed by a sample of nurses who were not involved in the remainder of the study. This review elicited comments from participants regarding readability, wording and ease in using the questionnaire. These comments directed a process whereby questionnaire items were edited with regard to the above criteria.

Once the questionnaire wording was established, the Pain Beliefs Questionnaire was pretested for reliability.

Subjects. For the purposes of pretesting, a sample of third-year nursing students who were not involved in the subsequent study was employed.

Procedure. Subjects completed the inventory on two occasions separated by approximately one month (Appendix I(C) contains a copy of the consent form presented to nursing student subjects). Third-year nursing students were considered suitable because of the finding by Davitz and Davitz (1980, 1981) that nurses' inferences of suffering change most drastically over their first year of training and do not appear to change significantly in subsequent years. Providing that suitable reliability could be established, the inventory would then be employed in the remaining studies.
Study A.

Subjects. Subjects were consenting, consecutive surgical patients and their attendant, consenting nurses. Patients whose pain was managed through the use of a patient-controlled analgesic pump were excluded from the proposed research as the nurse was not involved in decisions regarding analgesic dosages in such a scheme. As well, all patients in the proposed study must have been prescribed a range of possible dosages so that, again, the nurse had an opportunity to exercise his/her judgement in the delivery of analgesic medications. Surgery patients were selected for this study based on the judgement by the research assistant, herself a registered nurse, that the procedure the patient underwent involved the potential for significant pain on the part of patients, a necessary requirement of the present research. Data was collected from nurses and patients in a hospital in a medium sized prairie city. To preserve the anonymity of the institutional setting, it will be referred to as Prairie General Hospital.

Procedure. Both nurse subjects and patient subjects were asked to complete a consent form. Appendices I(D) and I(E) contain copies of the consent forms completed by nurse and patient subjects respectively. Patient subjects were approached by a research assistant on the second post-operative day and asked to participate in a study investigating their pain experience. Nurse subjects were asked to participate in a study of nurses’ beliefs about pain and its management.
All subjects were debriefed regarding the true purposes of the present research following the collection of the data. Nurse subjects were debriefed during an inservice delivered to them while patient subjects were debriefed in a letter sent to them describing the study and its results. Appendices I(F) and I(G) contain copies of the debriefing scripts presented to nurse and patient subjects respectively.

Assessments of the amount of pain suffered by each patient was conducted on the second post-operative day approximately six hours after a shift change. The six hour interval allowed the nurse to have administered at least one dose of pain medication to his or her patient before the patient’s pain is assessed. The proposed study employed three indices of patient pain derived from the short-form McGill Pain Questionnaire (Melzack, 1987) (see Appendix I(H) for a copy of the short-form McGill Pain Questionnaire) which were related to Pain Beliefs scores and to scores obtained on the constructs of Ajzen and Fishbein’s (1980) Theory of Reasoned Action.

Two indices of nurses’ pain management behaviour were also employed. The first index of nurses’ pain management behaviour was derived by observing the amount of drug administered relative to the range allowed in the prescription for that particular patient. This variable was computed by dividing the difference between the maximum allowable dosage and the dosage delivered by the difference between the maximum and minimum allowable dosages. Therefore, this index ranged from a score of zero (0) to indicate
that the minimum dose was delivered to one (1) which would indicate that the maximum dose was delivered.

The second index of nurses’ pain management behaviour was derived by observing the frequency of drug administrations relative to that allowed in the prescription for that particular patient. This variable was computed by subtracting the actual interval between narcotic analgesic administrations by the interval recommended in the prescription order.

The direct assessment of patient’s pain using the McGill Pain Questionnaire (Melzack, 1987) was completed prior to assessment of the constructs involved in McCaffery’s and Charap’s models (Appendix I(I) contains a copy of the inventory which will be used to assess perceived supervisor beliefs, the motivation to comply with the nursing supervisor and the strength of the intention to increase or not increase the blood level of pain medication). Data was gathered in this fashion to avoid the problem of nurse subjects determining the purpose of the study and modifying their patient-care behaviour accordingly. If nurses were to complete the questionnaires prior to the collection of the data regarding patient pain there would be the possibility that they could discern the purposes of the research and modify their subsequent pain management behaviour, thereby invalidating the present research. Data from nursing charts regarding the dosages delivered and the interval between dosages relative to that allowed for by the prescription order was gathered after all other measures were collected.
Results

The Study A - Pilot.

The Pain Beliefs Questionnaire was pre-tested on a sample of 57 third-year nursing students. Appendix I(J) contains descriptive statistics for each item of the 50-item Pain Beliefs Questionnaire (PBQ). Appendix I(K) contains the item-total statistics for the 50-item Pain Beliefs Questionnaire. The coefficient alpha for the 50-item Pain Beliefs Questionnaire was found to be 0.64. The coefficient alpha value for the Pain Beliefs Questionnaire was maximized by considering both the standard deviation and the item-total correlation of each item (Allen & Yen, 1979). That is, the product of the standard deviation by the item-total correlation was computed for items comprising 10 versions of the Pain Beliefs Questionnaire with numbers of items ranging from 30 to 12. Table 1 contains coefficient alpha values for these 10 versions of the Pain Beliefs Questionnaire. Versions of the Pain Beliefs Questionnaire with more items than 30 yielded consistently lower coefficient alpha values than those versions with fewer than 30 items. This procedure resulted in a 22-item Pain Beliefs Questionnaire. Appendix I(L) contains the item-total statistics for the 22-item Pain Beliefs Questionnaire using Study A - Pilot data. The coefficient alpha value for the 22-item Pain Beliefs Questionnaire was found to be 0.83. Appendix II contains a copy of the 22-item Pain Beliefs Questionnaire.

Table 2 contains overall descriptive statistics for the
Table 1

Coefficient Alpha Values for each of 10 Versions of the Pain Beliefs Questionnaire Varying in Number of Items - Study A - Pilot Data.

<table>
<thead>
<tr>
<th>Version</th>
<th>Coefficient alpha value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBQ30</td>
<td>.7574</td>
</tr>
<tr>
<td>PBQ28</td>
<td>.7913</td>
</tr>
<tr>
<td>PBQ26</td>
<td>.8056</td>
</tr>
<tr>
<td>PBQ24</td>
<td>.8236</td>
</tr>
<tr>
<td>PBQ22</td>
<td>.8303</td>
</tr>
<tr>
<td>PBQ20</td>
<td>.8263</td>
</tr>
<tr>
<td>PBQ18</td>
<td>.8257</td>
</tr>
<tr>
<td>PBQ16</td>
<td>.8306</td>
</tr>
<tr>
<td>PBQ14</td>
<td>.8278</td>
</tr>
<tr>
<td>PBQ12</td>
<td>.8250</td>
</tr>
</tbody>
</table>
Table 2

**Descriptive Statistics for the 50- and 22-item Pain Beliefs Questionnaire from Study A - Pilot Data.**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBQ50</td>
<td>135.91</td>
<td>14.19</td>
<td>100.00</td>
<td>165.00</td>
</tr>
<tr>
<td>PBQ22</td>
<td>46.35</td>
<td>12.03</td>
<td>27.00</td>
<td>72.00</td>
</tr>
</tbody>
</table>
50-item Pain Beliefs Questionnaire as well as the 22-item Pain Beliefs Questionnaire from Study A - Pilot data. The test-retest correlation was computed for both the 50-item Pain Beliefs Questionnaire and the 22-item Pain Beliefs Questionnaire. The test-retest correlation for the 50-item Pain Beliefs Questionnaire was found to be 0.76 whereas the same correlation for the 22-item Pain Beliefs Questionnaire was found to be 0.70.

Due to the acceptable coefficient alpha value and test-retest correlation, the 22-item Pain Beliefs Questionnaire was utilized in Study A.

**Study A.**

**Description of the samples.** The average age of patient subjects was 56.75 years. They were predominantly female (91%) and were hospitalized for a variety of surgical procedures. The average length of stay in hospital for patient subjects was 9.44 days.

All nurse subjects participating in this research were female. The average number of years of experience was: full-time 8.86 years; part-time, 2.38 years; casual, 2.27 years. 73% reported that they had been hospitalized for a painful procedure.

**The Incidence of Post-Operative Pain in the Patient Sample.**

Patient data were analyzed separately to investigate the occurrence of post-operative pain in the patient sample. This analysis attempts to replicate the findings of Marks and Sachar
(1973) and others (Cohen, 1980; Keeri-Szanto & Heaman, 1972; Knight & Metha, 1978; Melzack, Abbott, Zacker, Mulder & Davis, 1987) who have documented the occurrence of moderate to severe pain in a variety of patient populations.

Table 3 presents descriptive statistics for variables on the Short-form McGill Pain Questionnaire (Melzack, 1987). The number of subjects in this analysis is larger than for the remaining analyses in this study as data for patients was collected prior to nurse data. Due to the low response rate among potential nurse subjects, a large proportion of the patient data could not be associated with an attendant nurse for the analyses testing the major hypotheses of the study. All patient data was utilized in the analysis to determine the incidence of pain in the patient sample.

An examination of Table 3 reveals that in the current study the intensity of post-operative pain in the sample is best described as mild to moderate. The first index of pain intensity consists of fifteen pain descriptors such as "throbber", "sharp", "fearful" and "aching". Patients rate their pain on a 4-point scale to indicate the degree to which each descriptor applies to their pain. The mean of 2.02 on this index indicates that most subjects rated the descriptors as "mild" in relation to their pain. The second index is comprised by a 93 mm visual analogue scale with the descriptors "no pain" and "worst possible pain" at either end. The mean of 57.48 on this index indicates that the average patient placed their mark at the 62% mark on the
Table 3

**Descriptive Statistics for Variables in the Short-Form McGill Pain Questionnaire (Melzack, 1987).**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain Descriptors - 15 items</td>
<td>2.02</td>
<td>.52</td>
<td>1.13</td>
<td>3.47</td>
</tr>
<tr>
<td>93mm Visual Analogue Scale</td>
<td>57.48</td>
<td>23.37</td>
<td>8</td>
<td>93</td>
</tr>
<tr>
<td>Global Pain Intensity</td>
<td>3.77</td>
<td>1.14</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>
scale, closer to "worst possible pain". This result is interpreted as evidence of moderate pain in the sample. Finally, the third index is a 6-point index of pain intensity with the descriptors "no pain, mild, discomforting, distressing, horrible and excruciating". The mean of 3.77 indicates that the average response falls between "discomforting" and "distressing". Again, this result is considered indicative of moderate pain in the sample.

**Reliability of the Pain Beliefs Questionnaire.**

Study A was conducted with a sample of 24 nurses at Prairie General Hospital and their patients. Between one and five patients were associated with each nurse participating in the study. Appendix I(M) contains descriptive statistics for each of the items in the 22-item Pain Beliefs Questionnaire using data from Study A. Appendix I(N) contains the item-total statistics for the 22-item Pain Beliefs Questionnaire using Study A data. The coefficient alpha for the 22-item Pain Beliefs Questionnaire was found to be .7035.

**Hypotheses Derived from McCaffery’s Theory.**

Three indices of patient pain were derived from the short-form of the McGill Pain Questionnaire (Melzack, 1987) for use in further analyses. The first was the sum of the first 15 McGill Pain Questionnaire Pain Descriptor items. The second was patients’ responses on the 93 millimetre visual analogue scale of
pain intensity. The third was patients' ratings of their overall pain on the 6-point scale of pain intensity. Table 4 presents descriptive statistics for the three indices of patient pain and for the two indices of nurses' pain management behaviour. Table 5 presents intercorrelations between these variables.

It was predicted that indices of nurses' pain management behaviour would correlate significantly with indices of patient pain. This hypothesis was not supported as none of the correlations achieved significance (see Table 5). It was predicted that scores on the Pain Beliefs Questionnaire would correlate significantly with indices of nurses' pain management behaviour and that this correlation would be attenuated by partialling out the effect of social desirability in responding. Table 6 presents these correlations and partial correlations. This hypothesis was not supported as none of the correlations achieved statistical significance.

It was hypothesized that relationships between Pain Beliefs Questionnaire scores and indices of patient pain would be mediated by the nurse pain management indices. Table 7 reveals that the Pain Beliefs Questionnaire failed to correlate significantly with indices of patient pain although the correlation with one index approached significance. Controlling, through partial correlations, for the effect of the nurse pain management behaviours did not attenuate these correlations. This result provides evidence against the hypothesis that nurses'
## Table 4

**Descriptive statistics for the three indices of patient pain and the two indices of nurses’ pain management behaviour.**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of 15 MPQ pain descriptors</td>
<td>30.94</td>
<td>7.14</td>
<td>17.00</td>
<td>49.00</td>
</tr>
<tr>
<td>93 mm visual analogue scale</td>
<td>57.69</td>
<td>20.01</td>
<td>13.00</td>
<td>93.00</td>
</tr>
<tr>
<td>Global pain intensity</td>
<td>3.78</td>
<td>1.13</td>
<td>2.00</td>
<td>6.00</td>
</tr>
<tr>
<td>Interval¹</td>
<td>258.37</td>
<td>338.08</td>
<td>-120.00</td>
<td>1235.00</td>
</tr>
<tr>
<td>Narcotic Ratio²</td>
<td>0.90</td>
<td>0.24</td>
<td>0.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

¹ Interval is calculated as the mean of the difference between the interval between the last two narcotic analgesic administrations and the interval suggested by the prescription order, averaged across each nurse subject’s patients.

² The ratio of narcotic analgesia administered is calculated as the difference between the dose of narcotic analgesia administered and the lower limit of the range allowed by the prescription order divided by the difference between the upper and lower limits of the range allowed by the prescription order, averaged across each nurse subject’s patients.
Table 5

**Intercorrelations Among the Variables in McCaffery’s Theory.**

<table>
<thead>
<tr>
<th></th>
<th>Interval</th>
<th>Narcotic Ratio</th>
<th>MPQ1</th>
<th>MPQ2</th>
<th>MPQ3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narcotic Ratio</td>
<td>-0.0187</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPQ1</td>
<td>-0.2709</td>
<td>-0.3227</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPQ2</td>
<td>-0.2035</td>
<td>0.0463</td>
<td>0.5762**</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>MPQ3</td>
<td>-0.1950</td>
<td>-0.1578</td>
<td>0.7549**</td>
<td>0.7034**</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

**p < .01
Table 6

Correlations and Partial Correlations, Controlling for Social Desirability, Between the Pain Beliefs Questionnaire and the Two Indices of Nurses’ Pain Management Behaviour.

<table>
<thead>
<tr>
<th></th>
<th>Interval</th>
<th>Narcotic Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero-order correlations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBQ</td>
<td>.2401</td>
<td>.3009</td>
</tr>
<tr>
<td>Partial correlations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBQ</td>
<td>.1244</td>
<td>.2532</td>
</tr>
</tbody>
</table>

*p < .05
Table 7

Correlations and Partial Correlations Between the Pain Beliefs Questionnaire and Indices of Patient Pain.

<table>
<thead>
<tr>
<th></th>
<th>MPQ1</th>
<th>MPQ2</th>
<th>MPQ3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBQ</td>
<td>.0461</td>
<td>.2409</td>
<td>.0758</td>
</tr>
</tbody>
</table>

Zero-order correlations

Partial correlations - Controlling for Interval and Narcotic Ratio

<table>
<thead>
<tr>
<th></th>
<th>MPQ1</th>
<th>MPQ2</th>
<th>MPQ3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBQ</td>
<td>.2700</td>
<td>.2674</td>
<td>.2324</td>
</tr>
</tbody>
</table>

Partial correlations - Controlling for Social Desirability

<table>
<thead>
<tr>
<th></th>
<th>MPQ1</th>
<th>MPQ2</th>
<th>MPQ3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBQ</td>
<td>.1760</td>
<td>.3029</td>
<td>.1386</td>
</tr>
</tbody>
</table>

*p < .05
pain management behaviours mediate any relationship between Pain Beliefs Questionnaire scores and patient pain. It is also not surprising, given the lack of relationships between the variables generally. Controlling for social desirability in responding also did not increase correlations between Pain Beliefs Questionnaire scores and indices of patient pain.

**Hypotheses Derived from Charap’s Theory.**

Table 8 presents descriptive statistics for each of the variables in Charap’s model. The subjective norm is the product of the Normative Belief of Supervisors and the Motivation to Comply.

It was hypothesized that the subjective norm would significantly predict intention and that intention would significantly predict nurses’ pain management behaviour. Table 9 presents the correlations between components of Charap’s theory and the indices of nurses’ pain management behaviour. The hypothesis regarding the prediction of the behavioural intention by the subjective norm was supported by a significant correlation between these variables ($r = .7243$, $p < .01$). However, the second hypotheses was not supported. That is, the behavioural intention was not significantly correlated with the behaviour. Ajzen and Fishbein (1980) have argued that a number of factors can interfere with the relationship between intention and behaviour. Indeed, the intention to perform any behaviour can be interfered with by a host of environmental variables, resulting
Table 8

Descriptive Statistics for Variables in Charap’s Model.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor’s Opinion</td>
<td>2.98</td>
<td>2.20</td>
<td>1.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Motivation to comply</td>
<td>3.49</td>
<td>.83</td>
<td>1.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>17.09</td>
<td>14.27</td>
<td>5.25</td>
<td>49.00</td>
</tr>
<tr>
<td>Behavioural Intention</td>
<td>2.74</td>
<td>2.38</td>
<td>1.00</td>
<td>7.00</td>
</tr>
</tbody>
</table>
Table 9

Correlations Between the Components of Charap's Model and the Indices of Nurses' Pain Management Behaviour.

<table>
<thead>
<tr>
<th></th>
<th>Interval</th>
<th>Narcotic Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>.3054</td>
<td>-.0175</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>.5213*</td>
<td>-.0158</td>
</tr>
<tr>
<td>Perception of the supervisor's opinion</td>
<td>.4312*</td>
<td>.0632</td>
</tr>
<tr>
<td>Motivation to comply with the supervisor</td>
<td>.2046</td>
<td>-.2482</td>
</tr>
</tbody>
</table>

*p < .05
in an intention-behaviour correlation which is lower than that which might be expected.

Further examination of Table 9 demonstrates that, rather than the behavioural intention, more distal variables in this study bear a stronger relationship to the nurse behaviours measured. Specifically, the perception of the supervisor's opinion and the subjective norm were found to be significantly correlated with the interval between narcotic analgesic administrations. These correlations, however, are in the opposite direction than predicted in that the stronger the subject's perception that his/her nursing supervisor would have him/her increase the blood level of analgesia, the longer the interval between narcotic analgesic administrations for his/her patients. None of the variables were found to correlate significantly with the ratio of narcotic analgesia administered relative to the range allowed by the prescription order.

It was hypothesized that the correlation between subjective norm and intention should be significantly larger than the correlation between Pain Beliefs Questionnaire scores and intention. This hypothesis was not supported (Subjective Norm/Intention $r = .7243$; Pain Beliefs Questionnaire/Intention $r = .4572$; $t = 1.89$, d.f. = 30, $p < .10$). Had the sample size been larger, it is likely that the difference between the correlations would have been significant.
Testing for Sampling Bias.

As a number of potential nurse subjects declined to participate in this research, there was a pool of patient data which had no associated nurse data, that is, their attendant nurses were not subjects. This pool of patient subject data was used to test for bias in sampling by comparing scores on the dependent variables for these patients with the patients of nurses who participated in the study. The results are presented in Table 10. As shown in Table 10, nurses who failed to participate in the study administered significantly less narcotic analgesia, relative to that allowed for by the prescription, than nurses who participated in the study. Indeed, of nurses who participated in the study, less than 10% administered less than the full prescribed analgesic dose. Of those nurses who did not participate 35% administered less than the full prescribed analgesic dose. No other significant differences emerged on the remaining dependent variables.

Testing for Consistency Within Nurse Subjects.

The intraclass correlation coefficient (Hays, 1963, 1973) was computed with regard to Pain Beliefs Questionnaire scores and each of the dependent variables in the study. The intraclass correlation coefficient is a measure of the magnitude of experimental effect (omega-squared) in analysis of variance designs. In the present context, the "treatments" are the individual nurse subjects and the dependent variables are the
Table 10

T-tests for Differences on the Dependent Measures for Nurses who Did Not Participate (Group 1) vs. Nurses Who Did Participate in the Study (Group 2).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>s.d.</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narcotic</td>
<td>1</td>
<td>46</td>
<td>.6630</td>
<td>.472</td>
<td></td>
</tr>
<tr>
<td>Ratio</td>
<td>2</td>
<td>51</td>
<td>.9020</td>
<td>.300</td>
<td>&lt; .002</td>
</tr>
<tr>
<td>Interval</td>
<td>1</td>
<td>45</td>
<td>397.89</td>
<td>55.47</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>51</td>
<td>466.85</td>
<td>65.37</td>
<td>&lt; .128</td>
</tr>
<tr>
<td>MPQ1</td>
<td>1</td>
<td>53</td>
<td>30.037</td>
<td>8.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>57</td>
<td>30.947</td>
<td>7.42</td>
<td>&lt; .577</td>
</tr>
<tr>
<td>MPQ2</td>
<td>1</td>
<td>52</td>
<td>55.365</td>
<td>23.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>57</td>
<td>59.351</td>
<td>23.67</td>
<td>&lt; .853</td>
</tr>
<tr>
<td>MPQ3</td>
<td>1</td>
<td>53</td>
<td>3.660</td>
<td>1.018</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>57</td>
<td>3.877</td>
<td>1.269</td>
<td>&lt; .111</td>
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nurses' "effects". Therefore, the magnitude of experimental effect, in this instance, is a measure of the consistency of scores on the dependent variables for each nurse and is calculated using the following equation:

\[
\text{intraclclass correlation coefficient} = \frac{MS_{\text{treat}} - MS_{\text{error}}}{MS_{\text{treat}} + (n-1)MS_{\text{error}}}
\]

Table 11 presents the intraclclass correlation coefficient for each of the dependent variables. While the magnitude of experimental effect refers to the percentage of variance attributable to treatment effects, the intraclclass correlation coefficient refers to the percentage of variance in the dependent variables which can be attributable to the Pain Beliefs Questionnaire scores of the attendant nurses. An examination of Table 11 reveals that the intraclclass correlation coefficient for two of the dependent variables are negative owing to the larger value of \(MS_{\text{error}}\) relative to \(MS_{\text{treat}}\) for these variables. In general, intraclclass correlation coefficients for the five dependent variables are small, suggesting that nurse subjects were not consistent in the treatment of patients in their care. Even the largest value, .2311 for the interval variable, is small considering that only 23% of the variance in the interval between narcotic analgesic administrations can be attributed to Pain Beliefs Questionnaire scores.
Table 11

Intraclass Correlation Coefficients for each of the Dependent Variables with the Pain Beliefs Questionnaire Scores of the Attendant Nurse Subjects.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intraclass correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narcotic Ratio</td>
<td>-.0210</td>
</tr>
<tr>
<td>Interval</td>
<td>.2311</td>
</tr>
<tr>
<td>MPQ1</td>
<td>-.0222</td>
</tr>
<tr>
<td>MPQ2</td>
<td>.0729</td>
</tr>
<tr>
<td>MPQ3</td>
<td>.0543</td>
</tr>
</tbody>
</table>
Discussion

In the current investigation, two models for predicting the narcotic analgesic administration behaviour of nurses were examined. The first model was derived from the hypotheses of McCaffery (1979) who suggested that nurses' adherence to myths about pain would be associated with poor pain control in their patients. A Pain Beliefs Questionnaire (PBQ) was devised and pilot-tested for this purpose. The second model utilized a portion of Ajzen and Fishbein's (1980) behavioural intention model which considered the opinions of others in decision-making to create a model to test an hypothesis of Charap (1978). Charap (1978) suggested that nurses may medicate their patients in accordance with the directives of their nursing superiors. Three indices of patient pain and two indices of nurse behaviour were utilized.

Good support for the internal consistency of the Pain Beliefs Questionnaire was found. A 22-item version of the Pain Beliefs Questionnaire had the highest coefficient alpha value at .8303. Little evidence for the external validity of the Pain Beliefs Questionnaire was found in this study, however. However, due to a much smaller than anticipated sample size and problems with measurement of nurses' pain management behaviours, discussed below, analyses to determine the external validity of the Pain Beliefs Questionnaire are likely to not have constituted a fair test.

In general, the results of Study A did not provide support
for McCaffery's (1979) model. When social desirability in responding was controlled for using Edwards (1957) Social Desirability Scale, near-significant partial correlations were found between the Pain Beliefs Questionnaire and one of the three indices of patient pain. The variables thought to mediate this relationship, however, the amount of narcotic analgesia administered and the interval between analgesic administrations, were not found to be significantly related to either Pain Beliefs Questionnaire scores or patient pain. Possible explanations for this result will be discussed in the Design and Analysis section below.

Weak support for Charap's (1978) model was found in the analysis. A significant correlation was observed between the subjective norm and the behavioural intention but the behavioural intention was not correlated with the specific pain management behaviours of nurses. Components of the model conceptualized as more distal to pain management behaviours than the behavioural intention were significantly but negatively correlated with pain management behaviours. That is, the more the nurse subjects indicated that their nursing supervisor would have them increase the blood level of narcotic analgesia by increasing the dosage or the frequency of narcotic administrations, the longer the observed interval between narcotic analgesic administrations in their actual patients. Similarly, the normative beliefs of supervisors were significantly and negatively correlated with the interval between narcotic analgesic administrations. Finally, as
noted with regard to McCaffery’s model, above, the specific pain management behaviours of nurses were not significantly correlated with patient ratings of pain.

Finally, the correlation between the subjective norm and the behavioural intention was not significantly larger than that between Pain Beliefs Questionnaire scores and the behavioural intention. This is counter to the hypothesis of Charap (1978) who suggested that the perception of the opinion of the supervisor with regard to analgesic administration behaviour might be more important than the beliefs of the individual nurse in predicting the administration of narcotic analgesics.

**Interpretations and Implications of Results.**

The results of this study with regard to the partial correlations computed and the multiple regression analysis are limited by the small number of potential nurse subjects who chose to participate. This issue is discussed in the Design and Analysis section below.

**McCaffery’s Model.**

Pain Beliefs Questionnaire scores were found to possess a near-significant correlation with one index of patient pain providing weak evidence for the external validity of the construct of adherence to pain myths. The most that can be said about this result is that it would appear that nurses’ adherence to myths about pain and its management have something of an
impact on the pain experienced by their patients. Nurses who scored higher on a measure of these beliefs tended to have patients who complained of more pain (on one of the three indices of pain) than the patients of nurses who scored lower on the measure of pain myths. McCaffery (1981) has suggested that nurses who fail to respond adequately to the pain of their patients may well have rigid attitudes about how pain ought to be expressed. McCaffery (1979, 1981) has long been a proponent of the notion that pain should be defined by the person experiencing the pain and that the behavioural expression of pain is variable across patients. If the Pain Beliefs Questionnaire may be considered a measure of inflexible attitudes regarding pain and its expression, the extent to which nurses ascribe to these attitudes may be at least somewhat predictive of the quality of pain control his/her patients are likely to experience.

Nurses were given the opportunity to make free-response written comments when they completed the subject materials. Very few subjects chose to provide comments but those that were provided may offer some insights into the above results. Nurse subjects volunteered that "Doctors and nurses are poorly trained in pain control" and "Young nurses undermedicate due to fear of [medical] complications". The first of these comments suggests that, if nurses are poorly trained in pain control, their attitudes and beliefs about pain and its management are not systematically addressed in their training. If this is true, then attitudes regarding the importance of stoicism in pain and
moral values regarding the use of narcotic medication may interfere with effective pain control. The second comment suggests that the training nurses receive regarding pain and its management sensitizes them to the possibility of harming their patients through the administration of excessive amounts of narcotic analgesia, despite research suggesting that pain can be managed with narcotic analgesia with little risk of harm. Indeed, Ferrell, McCaffery and Rhiner (1992), in a review of nursing texts suggest that nurses’ training is focussed on the avoidance of negative consequences arising out of narcotic analgesic administration rather than on the benefits and the extremely low risk of complications. It would seem that a nurse concerned about the possibility of complications may choose to undermedicate rather than risk causing further problems for his/her patient. The reasoning here would appear to be the result of a cost/benefit analysis where the benefit of adequate pain control is outweighed by the fear of potential costs (although the likelihood of these negative outcomes is extremely small).

Taken together, the results of the Study A - Pilot and subsequent Study A provide support for the reliability of the Pain Beliefs Questionnaire and rather weak support for its validity.

Charap’s Model.

Charap’s model, which suggested that nurses medicate in
accordance with the directives of nursing superiors, received weak support in the present examination. Support was found for the hypothesis that the perception of nursing supervisor's opinions was related to the intention to medicate patients in a particular fashion. However, the specific pain management behaviours of nurses, hypothesized to mediate the relationship between the behavioural intention and patient pain were not correlated with either the behavioural intention or patient pain. The subjective norm and the normative beliefs of supervisors, variables conceptualized as more distal to pain management behaviours than the behavioural intention were significantly and negatively correlated with the interval between narcotic analgesic administrations. That is, the present study found that the more a nurse believed his/her supervisor would have him/her increase the blood level of narcotic analgesia in a patient and the more motivated that nurse was to comply with his/her supervisor, the longer the interval between narcotic analgesic administrations. This result is surprising and counter-intuitive. Potential problems with the measurement of nurses' pain management behaviours may have contributed to this result and will be discussed in the Design and Analysis section below.

Comments made by nurse subjects may clarify the above result. Nurse subjects commented that nurses are not the health care providers most responsible for the pain in their patients as "Most patients are undermedicated due to physician’s orders or perceptions". This comment speaks to the frustration detected in
nurses who are faced with inadequate prescriptions for narcotic analgesia and with physicians who do not value the opinions of nurses regarding the amount of pain their patients may be experiencing. Another nurse subject commented that "I don’t consult my supervisors, they are too busy. In this hospital we consult peers [on pain management issues]". This comment suggests that Charap’s (1978) hypothesis may not reflect the current state of affairs in hospitals where nurses are encouraged to consult each other, rather than formal supervisors, on issues of pain assessment and medication choices. Given this possibility, it may be that the questions regarding the opinions of supervisors were, essentially, meaningless to nurse subjects as it is not their practice to consult supervisors on these issues. Even if the nurse subjects responses were valid reflections of their perceptions of their supervisor’s opinions, if nursing supervisors are not involved in pain management the results may not be expected to bear a relationship with pain management decisions.

Charap (1978) hypothesized that the nurses’ perception of the opinion of his/her supervisor with regard to the administration of narcotic analgesia would be more important than the pain beliefs of the nurse him/herself in predicting the administration of narcotic analgesia. This hypothesis was not supported as the correlation between the subjective norm and the behavioural intention was not significantly larger than that between Pain Beliefs Questionnaire scores and the behavioural
intention. The fact that the subjective norm and the behavioural intention were assessed at the same level of behavioural specificity should have served to increase the correlation between these variables relative to the correlation between Pain Beliefs Questionnaire scores and the behavioural intention. The lack of equivalent behavioural specificity between Pain Beliefs Questionnaire items and the measure of the behavioural intention should have served to limit this correlation. These facts should have worked to increase the likelihood of finding a significant difference between the correlations and serves to increase the significance of this finding. The small sample size is relevant to this analysis and will be discussed below.

There are few studies against which to compare the results of the present investigation since, as mentioned earlier, no explicit studies into the mechanisms driving nurses' narcotic analgesic administration decisions has been conducted. Indeed, no studies were found that explicitly assessed nurses' narcotic analgesic administration behaviours.

**Design and Analysis Issues.**

The finding that Pain Beliefs Questionnaire scores were significantly correlated with one index of patient pain derived from the short-form McGill Pain Questionnaire but not with the constructs hypothesized to mediate this relationship is surprising. Similarly, the negative relationship between the Normative Belief and the Subjective Norm with a measure of
nurses’ pain management behaviour in Charap’s model requires consideration. These results may be due to problems with the measurement of constructs thought to reflect nurses’ narcotic analgesic administration behaviours. The study was designed such that McGill Pain Questionnaires would be administered on the second post-operative day and at least six hours following a shift change. Data was collected in this fashion to ensure that the nurse coming on shift would have had adequate opportunity to administer narcotic analgesia to a patient who is very likely to be experiencing pain from the previous day’s surgery. The research assistant was instructed to note the name of the nurse caring for the patient at the time the McGill Pain Questionnaire was administered, the dosage administered and the interval between the most recent dose and the previous dose. Following collection of the study data, a conversation with the research assistant who collected the data revealed that in an undetermined number of cases, the nurse associated with the patient at the time of the McGill Pain Questionnaire administration did not deliver a dose of narcotic analgesia to the patient. In these cases, the analgesia was administered by a different nurse. Therefore, in a certain number of cases, the indices of narcotic analgesia administered and dosage delivered were with reference to the nurse on the previous shift. There was no way to determine post hoc which of the cases in the data were affected by this problem and the validity of these indices is obviously suspect. Problems with the validity of these mediating variables
have certainly obscured relationships between Pain Beliefs Questionnaire scores and these variables and between the mediating variables and patient pain providing little useful information regarding the external validity of the Pain Beliefs Questionnaire.

A further problem with the methodology employed in the current study became apparent in the statistical analysis. An unanticipated selection bias limited the variability of the narcotic ratio index, and further limited the generalizability of the results of current study: nurses who participated administered significantly more analgesic than nurses who refused to participate. Indeed, this problem made adding the data of the current study to data which may have been collected using similar methodology in a subsequent study impossible.

The results of the current investigation are also severely limited by the small sample size employed. Particularly, conclusions drawn from the results of analyses involving multiple regression, partial correlations and the test of the difference between correlations are weakened due to the small number of subjects. This is reflected in the interpretations of results.

Of up to sixty-five nurses who may have chosen to participate, only twenty-six consented. This may have been caused by a number of factors. Morale at Prairie General Hospital was very low at the time of data collection. Nurses were concerned about the security of their jobs as health services in the city were in the process of being transferred
from the provincial government to the City Health Board. As had happened in other regions of the province, nurses were concerned about the possibility of hospital closures and the likelihood that nurses with seniority would "bump" less senior nurses, leaving them without employment. Further, the prospect of splitting up long-standing teams of nurses as the result of new nurses from other facilities coming into Prairie General Hospital was of concern. The problem of low morale is hypothesized to have reduced the willingness of nurses to take time away from their work to complete the questionnaire. Second, nurses at Prairie General Hospital had recently been required to complete lengthy surveys as part of a quality assurance program which might also have reduced their willingness to participate in another study. Third, the collection of patient data took longer than had been anticipated, resulting in the inability to access some nurses for whom patient data had been collected. The research assistant noted that an undetermined percentage of nurses were unavailable due to their having taken leaves or having moved on to new positions elsewhere within or outside of the hospital. Fourth, the research assistant indicated that she had received feedback from some nurses that they were distrustful of questions included in the social desirability scale. Whereas the first part of the questionnaire asked questions regarding pain management, the social desirability scale required the subjects to answer personal questions. The research assistant stated that a percentage of potential nurse subjects refused to
participate due to their objection to these personal questions. Taken together, the above factors served to significantly reduce the rate of compliance among potential nurse subjects.

A final problem with the data resulting from the current study was that the low intraclass correlation coefficients suggest that nurses did not behave particularly consistently across their patients. This situation may reflect the difference between having an intention to perform a behaviour and being able to enact a behaviour in the environment. Ajzen and Fishbein (1980) have noted that any number of environmental variables can interfere with one’s intention to enact any behaviour. In the current situation, a nurse may form an intention to administer a dose of narcotic analgesia but may be unable to enact the behaviour due to, for example, competing demands on his/her limited time or the performance of tasks with a higher priority than managing patient pain.

**Future Directions.**

The results of the present study are difficult to interpret for a number of reasons, including those listed above. Further, implications for nursing curricula are limited due to the relatively small number of variables considered in the present research relative to those suggested as important by other researchers (Hunt, 1992) and to the inability of the current methodology to discern causal relationships between the adequacy of nurse training and pain beliefs of nurses.
Problems with the validity of measures conceptualized as reflecting nurses’ specific pain management behaviours argue against a return to the methodology employed in the present investigation. Similarly, the unanticipated selection bias in which nurses who participated administered significantly more narcotic analgesia than those who chose not to participate and the finding that nurses did not enact pain management behaviours consistently across their patients suggests that the methodology should be significantly altered or abandoned.

The order in which the studies were conducted is also somewhat problematic in that the applied study described above may have been conducted prematurely. A more appropriate way to proceed may have been to examine the Pain Beliefs Questionnaire in a more theoretical study with reliance on established psychological theory before proceeding to an applied study such as that described above.

The focus on nurses and their impact on pain management of patients does not deny the important contribution of physicians in the process. A study similar to that conducted above, but utilizing physicians as well as, or instead of, nurses might provide more information regarding the overall pain management structure.
References

(References unique to the research presented in Appendix I (Jurgens, 1995))


Appendix I(A)
The 50-item Pain Beliefs Questionnaire and the Direction in Which Each Item is Scored
PAIN QUESTIONNAIRE

The following questions deal with the clinical management of patient pain. Because each person has their own opinion on the effectiveness of pain management strategies, there are no right or wrong answers. We are interested in your opinion regarding the statements below. Although certain questions may sound similar, each question is unique and important. Please indicate your agreement with each of the statements by circling the number corresponding to your choice under each statement.

1) If the patient appears to be distracted from his pain in conversation with the nurse, the pain is probably of low intensity. [agree]

   1  2  3  4  5  6
   strongly disagree
   strongly agree

2) Chronic pain is indicated by changes in patient vital signs. [agree]

   1  2  3  4  5  6
   strongly disagree
   strongly agree

3) P.R.N. analgesic orders are crucial in preventing tolerance and addiction. [agree]

   1  2  3  4  5  6
   strongly disagree
   strongly agree

4) If pain does not subside as expected after medication has been administered, it is probably because of a psychological problem. [agree]

   1  2  3  4  5  6
   strongly disagree
   strongly agree
5) Some real pain has no identifiable physical cause. [disagree]

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<th>4</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>strongly disagree</td>
<td></td>
<td></td>
<td></td>
<td>strongly agree</td>
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</table>

6) There is little danger that patients will become addicted to narcotic analgesic medication when these are used for therapeutic purposes. [disagree]

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<tbody>
<tr>
<td></td>
<td>strongly disagree</td>
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<td>strongly agree</td>
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7) Very few patients would take more analgesics than were required if given the opportunity to do so. [disagree]

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<tr>
<td></td>
<td>strongly disagree</td>
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8) Patients who keep records of their analgesic intake and request analgesic medications before they are due may be neurotic. [agree]

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9) Most chronic pain is the result of the patient’s anxiety, depression or personality problems. [agree]

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10) The amount of pain a patient is experiencing may actually decrease while he is being visited by his family. [disagree]

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11) When analgesics are prescribed p.r.n., the nurse should always check with the patient to see if the analgesic medication is required. [agree]

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12) The goal of pain management should be the complete relief of pain. [disagree]

1 2 3 4 5 6
strongly disagree
strongly agree

13) If a patient experiences withdrawal symptoms when narcotic analgesics are withdrawn, the patient is addicted. [agree]

1 2 3 4 5 6
strongly disagree
strongly agree

14) As the duration of pain increases, the likelihood that pain is real decreases. [agree]

1 2 3 4 5 6
strongly disagree
strongly agree

15) Pain management strategies other than medication are usually ineffective. [agree]

1 2 3 4 5 6
strongly disagree
strongly agree

16) Chronic pain is usually psychological as opposed to physiological. [agree]

1 2 3 4 5 6
strongly disagree
strongly agree

17) If the patient derives benefit from the sick role (i.e., family takes complete care of him/her), he/she probably exaggerates his/her pain. [agree]

1 2 3 4 5 6
strongly disagree
strongly agree

18) The maximum analgesic dosage in the range allowed by a physician’s order should be given only rarely. [agree]

1 2 3 4 5 6
strongly disagree
strongly agree
19) A nurse can usually tell if a patient is experiencing pain. [agree]

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20) Placebos may have the effect of reducing the amount of pain the patient experiences. [disagree]

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21) The use of placebos will not help determine if a patient’s pain is real. [disagree]

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22) Pain medication is most effective if given prior to severe pain onset. [disagree]

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23) Patients frequently "use" their pain to receive special favours or to get out of doing something unpleasant. [agree]

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24) Relaxation techniques are useful adjuncts to medication in the management of pain. [disagree]

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25) Development of tolerance to narcotic medication is rarely a problem in pain management. [disagree]

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26) The patient is the only one who really knows the extent of his/her pain. [disagree]

1 2 3 4 5 6
strongly disagree

27) Many patients receive inadequate pain management while hospitalized. [disagree]

1 2 3 4 5 6
strongly disagree

28) Chronic pain patients have a lower tolerance for pain than most people. [agree]

1 2 3 4 5 6
strongly disagree

29) Most patients who complain about pain are just hoping to receive narcotic medications or tranquilizers. [agree]

1 2 3 4 5 6
strongly disagree

30) Patients should be encouraged to change their bodily position as a way of decreasing the pain they experience. [disagree]

1 2 3 4 5 6
strongly disagree

31) Chronic pain is best managed by insuring that the patient is in the most physically comfortable position possible. [disagree]

1 2 3 4 5 6
strongly disagree

32) Patient anxiety has been shown to increase perceptions of the severity of pain. [disagree]

1 2 3 4 5 6
strongly disagree
33) Overmedication of patients is rarely a problem in pain management. [disagree]

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34) Patients ought to tolerate some pain in the interval between analgesic administrations. [agree]

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35) The problem of pain management is too complex to expect that every patient’s pain will be controlled. [agree]

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36) There is great variability in the pain trajectories of different patients who have the same disease or who experience the same surgical procedure. [disagree]

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37) Many chronic pain patients are addicted to their medication. [agree]

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38) Many patients complain about pain just to get some attention. [agree]

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39) Chronic pain will usually go away on its own. [agree]

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</table>
40) Massage is an ineffective strategy in managing patient pain. [agree]

   1   2   3   4   5   6
strongly disagree strongly agree

41) The patient should be the person most in control of their total pain management program. [disagree]

   1   2   3   4   5   6
strongly disagree strongly agree

42) The most frustrating patients to work with are chronic pain patients. [agree]

   1   2   3   4   5   6
strongly disagree strongly agree

43) In all hospitals there are some patients who experience pain which could have been controlled. [disagree]

   1   2   3   4   5   6
strongly disagree strongly agree

44) Surgery patients ought not to experience severe levels of pain during their hospital stay. [disagree]

   1   2   3   4   5   6
strongly disagree strongly agree

45) There are a number of analgesic and nonanalgesic drugs routinely administered in a hospital setting which are at least as addicting as morphine. [disagree]

   1   2   3   4   5   6
strongly disagree strongly agree

46) Patients should be encouraged to increase their pain tolerance. [agree]

   1   2   3   4   5   6
strongly disagree strongly agree
47) Most chronic pain patients sincerely wish their pain would go away completely. [disagree]

1 2 3 4 5 6
strongly disagree  strongly agree

48) Nurses should refer any patient with psychological problems which affect pain management to mental health professionals. [agree]

1 2 3 4 5 6
strongly disagree  strongly agree

49) Surgical patients should expect to endure more pain than other types of patients. [agree]

1 2 3 4 5 6
strongly disagree  strongly agree

50) The amount of narcotic analgesic administered to a patient should be reduced if the patient experiences euphoria. [agree]

1 2 3 4 5 6
strongly disagree  strongly agree

Thank you for your careful attention to this questionnaire.

If you have any comments regarding this questionnaire, please provide these in the space below.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Appendix I(B)

Edwards (1957) Social Desirability Scale

and the Direction in Which Each Item is Scored
SD Scale

Instructions: This inventory consists of numbered statements. Read each statement and decide whether it is true as applied to you or false as applied to you. Then circle either True or False after each statement. Remember to give your own opinion of yourself and respond to every statement. Now begin with statement 1. [Keyed responses are underlined]

1. My hands and feet are usually warm enough.       TRUE  FALSE

2. I am very seldom troubled by constipation.        TRUE  FALSE

3. I find it hard to keep my mind on a task or job. TRUE  FALSE

4. Most any time I would rather sit and daydream than do anything else. TRUE  FALSE

5. My family does not like the work I have chosen (or the work I intend to choose for my life work). TRUE  FALSE

6. My sleep is fitful and disturbed.                 TRUE  FALSE

7. I am liked by most people who know me.           TRUE  FALSE

8. I am happy most of the time.                      TRUE  FALSE

9. Criticism or scolding hurts me terribly.          TRUE  FALSE

10. It makes me impatient to have people ask my advice or otherwise interrupt me when I am working on something important. TRUE  FALSE

11. I have had periods in which I carried on activities without knowing later what I had been doing. TRUE  FALSE

12. I cry easily.                                     TRUE  FALSE

13. I do not tire quickly.                           TRUE  FALSE

14. I am not afraid to handle money.                 TRUE  FALSE

15. It makes me uncomfortable to put on a stunt at a party even when others are doing the same sort of thing. TRUE  FALSE

16. I frequently notice my hand shakes when I try to do something. TRUE  FALSE
17. It does not bother me particularly to see animals suffer.  TRUE  FALSE
18. I dream frequently about things that are best kept to myself.  TRUE  FALSE
19. My parents and family find more fault with me than they should.  TRUE  FALSE
20. I have reason for feeling jealous of one or more members of my family.  TRUE  FALSE
21. No one cares much what happens to you.  TRUE  FALSE
22. I usually expect to succeed in things I do.  TRUE  FALSE
23. I sweat very easily even on cool days.  TRUE  FALSE
24. When in a group of people I have trouble thinking of the right things to talk about.  TRUE  FALSE
25. I can easily make other people afraid of me, and sometimes do for the fun of it.  TRUE  FALSE
26. I am never happier than when alone.  TRUE  FALSE
27. Life is a strain for me much of the time.  TRUE  FALSE
28. I am easily embarrassed.  TRUE  FALSE
29. I cannot keep my mind on one thing.  TRUE  FALSE
30. I feel anxiety about something or someone almost all the time.  TRUE  FALSE
31. I have been afraid of things or people that I know could not hurt me.  TRUE  FALSE
32. I love to go to dances.  TRUE  FALSE
33. I enjoy the excitement of a crowd.  TRUE  FALSE
34. I feel hungry almost all the time.  TRUE  FALSE
35. I worry quite a bit over possible misfortunes.  TRUE  FALSE
36. It makes me nervous to have to wait.  TRUE  FALSE
37. I blush no more often than others.  TRUE  FALSE
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<tr>
<td>38. Often, even though everything is going fine for me, I feel that I don’t care about anything.</td>
<td>TRUE  FALSE</td>
</tr>
<tr>
<td>39. I sometimes feel that I am about to go to pieces.</td>
<td>TRUE  FALSE</td>
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Appendix I(C)

Consent Form Presented to Nurse Subjects

in Study A - Pilot
CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Name of Researcher: Douglas W. Jurgens, M.A.

Supervised by: Carl von Baeyer, Ph.D.

Title: The reliability and factor structure of a questionnaire to assess beliefs about pain.

Objective: To gather information regarding the reliability and factor structure of a new questionnaire designed to assess beliefs about pain.

Rationale: Your participation in this study will aid in the development of a new questionnaire designed to assess beliefs about pain.

Procedure: You will be asked to complete the new questionnaire while on duty on two occasions separated by approximately one month.

Direct benefits to subjects: You will benefit by receiving information regarding how new questionnaires are developed after you have completed the questionnaire the second time.

Possible risks: There is no risk associated with your participation in this research. Your identity will be protected through the assignment to you of a number code which will be used to identify your questionnaires. The master list associating your name with your number code will be destroyed after you complete the questionnaire the second time.

If I have any further questions I may submit them to Dr. Carl von Baeyer, Department of Psychology, University of Saskatchewan (306-966-6683).

I, _____________________________ of _____________________________ have read the above protocol and agree to participate. The procedure and its possible risks have been explained to me by Douglas Jurgens and I understand them.

I understand that I am free to withdraw from this study at any time.

_________________________________________  ________________
(signed)                                      (date)

_________________________________________
(witness)
Appendix I(D)

Consent Form Presented to Nurse Subjects in Study A
UNIVERSITY OF SASKATCHEWAN
DEPARTMENT OF PSYCHOLOGY

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Name of Researcher: Douglas Jurgens, M.A.

Supervised by: Carl von Baeyer, Ph.D.

Title: Nurses’ beliefs about pain.

Objective: To assess nurses’ beliefs about pain and its management.

Rationale: Nurses’ responses to a questionnaire and the notes which they make on patient charts will provide information regarding nurses’ beliefs about pain.

Procedure: Participants will complete the questionnaire assessing beliefs about pain. No more than a half-hour should be necessary to complete the questionnaire. Participant’s names on the questionnaire will be exchanged for a number code by an assistant to protect the identity of participants. This number will come from a master list which will be destroyed after the study is completed so that participants’ names will not be associated with their questionnaire responses. A second assistant will review notes on nursing charts. At the completion of the study, participants will receive feedback regarding their participation in the study through a presentation made by the researcher.

Direct benefits to participants: Participants will benefit directly from their participation in this research in that they will receive feedback concerning the results which should inform them of the beliefs about pain which are common among nurses.

Possible risks: There is no foreseeable risk associated with participation in this study. You are invited to discuss any concerns you may have with the researcher.

If I have any further questions I may submit them to Dr. Carl von Baeyer, Department of Psychology, University of Saskatchewan, Saskatoon (306-966-6683).

I, ___________________________ of ___________________________ have read the above protocol and agree to participate. The procedure and its possible risks have been explained to me by ___________________________ and I understand them.
I understand that I am free to withdraw from this study at any time.

(signed)  (date)

(witness)
Appendix I(E)

Consent Form Presented to

Patient Subjects in Study A
UNIVERSITY OF SASKATCHEWAN
DEPARTMENT OF PSYCHOLOGY

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Name of Researcher: Douglas Jurgens, M.A.

Supervised by: Carl von Baeyer, Ph.D.

Title: An investigation of the pain associated with certain surgical procedures.

Objective: To assess the amount of pain associated with certain surgical procedures.

Rationale: To assess the amount of pain associated with certain surgical procedures, patients who have experienced these surgical procedures will be asked to answer questions about the amount of pain they are experiencing post-operatively.

Procedure: You will be asked questions regarding the pain you are experiencing. These questions will take approximately one half-hour. Your name is required on the materials but it will be exchanged for a number code by an assistant. There will be no permanent record of your involvement in this study. Because the amount and kind of analgesic medication which you are receiving will affect the pain which you report, an assistant will also review your medical record so that medications received may be noted. When your participation is complete, the assistant will inquire as to whether you would like to have a summary of the study’s results upon the completion of the research. If you indicate that you would like a summary, one will be mailed to you.

Possible risks and benefits: While you will not benefit directly from your participation in this research, the results may lead to an improvement in pain management which may benefit yourself or others in future.

There is no foreseeable risk associated with your participation in this study. You are invited to discuss any questions or concerns you may have with the researcher.
If I have any further questions I may submit them to Dr. Carl von Baeyer, Department of Psychology, University of Saskatchewan, Saskatoon (306-966-6683).

I, _____________________________ of _____________________________ have read the above protocol and agree to participate. The procedure and its possible risks have been explained to me by _____________________________ and I understand them.

I understand that I am free to withdraw from this study at any time.

______________________________  _____________________________
(signed)  (date)

______________________________
(witness)
Appendix I(F)

Debriefing Script Presented to

Nurse Subjects in Study A
DEBRIEFING SCRIPT

When each of you originally consented to take part in the research project which I am about to describe, you were informed that the purpose of the study was to determine nurses' beliefs about pain. As the study has now been completed, I can now inform you that the purpose of the study actually included using the beliefs which you provided to predict your pain management behaviour with actual patients. If you have any questions please feel free to ask them during the presentation or wait until the presentation is complete and ask me afterwards.

Briefly, this research project was concerned with predicting nurses' pain management decisions from their pain beliefs. I would like to remind you that neither your responses to the questionnaire you completed nor your medication practices with patients may be extracted from this research as all the data have been pooled and all identifying information has been removed from the questionnaires.

This research, then, investigated an hypothesis first presented by a nursing researcher named Margo McCaffery (present Figure 1). Briefly, Ms. McCaffery, in an attempt to explain the persistent undermedication for pain of hospital patients, suggested that nurses may hold certain beliefs about pain and its management which interfere with the delivery of adequate analgesic dosages. For example, Ms. McCaffery suggested that if nurses subscribed to beliefs such as "The risk of addiction with narcotic analgesics prescribed for pain is very high" or "Most patients complain about pain just to get attention", the patients of that nurse would likely experience more pain than the patient of a nurse who did not subscribe to such beliefs. The Pain Questionnaire you completed was designed to assess your pain beliefs and test McCaffery's hypothesis (present Pain Beliefs Questionnaire). Indeed, the larger focus of the study was whether the type of beliefs subscribed to by nurses would predict their pain management decisions.

A second hypothesis was also tested in this study. It has been suggested by a researcher named Charap that individual nurses' beliefs about pain management are less important than their perceptions of what their nursing supervisors would have them do. Some of the questionnaires you answered were designed to help us determine if this is an important factor (present subject materials used to assess the opinions of referents and motivation to comply; present Figure 2).

Your scores on all the questionnaires were related to the amount of pain experienced by your patients as well as to the dosage of analgesic medication which you delivered relative to the range allowed for by the prescription order and to the interval between analgesic dosages relative to the interval
allowed for by the prescription.

The research yielded the following results. Pain beliefs were found to have nonsignificant relationships with pain management practices (the amount of analgesia administered and the interval between analgesic medication administration) and with the pain scores of patients, although correlations between beliefs and pain scores were near the level of significance when social desirability scores were partialled out (present Edward's Social Desirability Scale). A measure of social desirability was included because some of the pain beliefs questions were very obvious in nature and we wished to control for the tendency to respond in the "appropriate" way as opposed to responding solely based on one's beliefs. Including such a measure is common in psychological research.

Charap's hypothesis was also not supported by the results (refer to Figure 2). The subjective norm was significantly correlated with the intention to administer analgesia. However, the nurse subject's perception of what his/her supervisor would have him/her administer in terms of analgesia and the subjective norm component of the model were negative predictors of the actual behaviour. That is, the stronger the subject's perception that his/her nursing supervisor would have him/her increase the blood level of analgesia, the longer the interval between narcotic analgesic administrations for his/her patients. I am unable to explain this paradoxical result. None of the variables were found to correlate significantly with the ratio of narcotic analgesia administered relative to the range allowed by the prescription order.

The results of this study, then, are limited as there were few significant relationships found between the variables of interest and one relationship was significant but in the opposite direction of that predicted. The results are further limited by apparent sampling bias. The analysis determined that nurses who participated in the study administered significantly more analgesia than nurses who chose not to participate. This is problematic because the sample employed was not representative of all nurses at R.G.H. as we hoped it would be.

I would like to thank Debbie Juarez, my research assistant, Auralee McPherson, and Susan Novak, who helped me throughout the study. I would also like to thank all the nurses and patients who took part in the study.

I am conducting a further study of pain management in which subjects are interviewed by telephone about pain management. As in the research I presented today, confidentiality is assured. Consent forms are available (point to them) and the study is spelled out in detail on the consent forms. If you have any questions, please approach me with them before I leave today or
contact me at (306) 953-3855, during business hours. Thank-you for your kind attention to this presentation today.
Appendix I(G)

Feedback Script Presented to

Patient Subjects in Study A
FEEDBACK SCRIPT

When you originally consented to take part in the research project which will be described below, you were informed that the purpose of the study was to determine the amount of pain associated with your surgical procedure. As the study is now complete, I can inform you that the purpose of the study included using nurses’ pain beliefs and its management to predict the amount of pain the nurses’ patients would experience post-operatively. If you have any questions please feel free to write me at the address listed at the end of this letter. I will be pleased to correspond with you regarding any aspect of this research project.

Briefly, this research project was concerned with the relationship between nurses’ pain beliefs and the pain management decisions which they make with actual patients such as yourself. I would like to remind you that the responses which you gave to me can not be extracted from this research as all the data have been pooled and all identifying information has been removed. Your confidentiality is assured.

This research, then, investigated two hypotheses presented by researchers named Margo McCaffery and Arthur Charap. Briefly, Ms. McCaffery, in an attempt to explain the persistent undermedication for pain of hospital patients, suggested that nurses may adhere to certain beliefs about pain and its management which interfere with the delivery of adequate analgesic dosages. For example, Ms. McCaffery suggested that if nurses subscribed to beliefs such as "The risk of addiction with narcotic analgesics prescribed for pain is very high" or "Most patients complain about pain just to get attention", the patients of that nurse would likely experience more pain than the patient of a nurse who did not subscribe to such beliefs.

Mr. Charap, on the other hand, suggested that the beliefs of a particular nurses are less a factor in their medication decisions than is their perceptions of what their nursing supervisors would have them do. When you answered the questions which you were asked regarding your pain, you were providing me with information which was then related to your nurses’ beliefs about pain and its management as well as to his/her tendency to perceive that his/her supervisor wanted him/her to behave in that way. As well, information from your medical chart regarding the dosage of analgesic medication which was delivered and the interval between analgesic medication administrations were also related to the above variables.

This research yielded the following results. Pain beliefs were found to have nonsignificant relationships with pain management practices (the amount of analgesia administered and the interval between analgesic medication administration) and
with the pain scores of patients.

Charap's hypothesis was also not supported by the results. The nurse subject's perception of what his/her supervisor would have him/her administer in terms of analgesia was a negative predictor of the actual pain management behaviour. That is, the stronger the subject's perception that his/her nursing supervisor would have him/her increase the blood level of analgesia, the longer the interval between narcotic analgesic administrations for his/her patients. I am unable to explain this paradoxical result. None of the variables were found to correlate significantly with the ratio of narcotic analgesia administered relative to the range allowed by the prescription order.

The results of this study, then, are limited as there were few significant relationships found between the variables of interest and one relationship was significant but in the opposite direction of that predicted. The results are further limited by apparent sampling bias. The analysis determined that nurses who participated in the study administered significantly more analgesia than nurses who chose not to participate. This is problematic because the sample employed was not representative of all nurses at R.G.H. as we hoped it would be.

I would like to thank Debbie Juarez, my research assistant, Auralee McPherson, and Susan Novak, who helped me throughout the study. I would also like to thank all the nurses who took part in the study. Finally, and importantly, I would like to thank you very much for your courteous participation in this important research project. Should you desire further correspondence with me regarding the project, please write me at:

Prince Albert Mental Health Centre  
Victoria Hospital  
Box 3003  
Prince Albert, SK.  
S6V 6G1

Yours Sincerely,

Douglas Jurgens, M.A.
Appendix I(H)

The Short Form of the McGill Pain Questionnaire

(Melzack, 1989)
# SHORT-FORM McGill Pain Questionnaire

**Ronald Melzack**

**Patient's Name:** 

**Date:** 

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<th>Moderate</th>
<th>Severe</th>
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<tr>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Shooting</td>
<td>0</td>
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<td>2</td>
<td>3</td>
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**PPI**

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</tr>
<tr>
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Appendix I(I)

Inventory to Assess Normative Beliefs, the Motivation to Comply and the Strength of the Intention to Perform or Not Perform the Behaviour
EXAMPLE
A patient undergoes a routine surgical procedure. The prescription order is for 20-30 milligrams of Codeine orally q4h prn. The nurse administers 20 milligrams after patient requests pain medication, every 6 hours on average.

Your nursing supervisor might approve or disapprove of increasing the blood level of pain medication in the patient by increasing the medication dosage, increasing the medication frequency or both. Please indicate what you believe your nursing supervisor would recommend with regard to increasing the blood level of pain medication and your motivation to comply with your nursing supervisor. Please remember that all your answers in this study will remain completely confidential. [Normative belief strength and motivation to comply respectively]

My nursing supervisor would recommend that I should ___:___:___:___:___:___:___ should not [+3 +2 +1 0 -1 -2 -3]

increase the blood level of pain medication in the patient by increasing the medication dosage, increasing the medication frequency or both.

How much do you want to do what your nursing supervisor thinks you should do?

___ not at all [0]
___ slightly [+1]
___ moderately [+2]
___ strongly [+3]

Please indicate whether or not you would perform the behaviour described below and how certain you are that you would do so. [Intention and strength of intention respectively]

I would ___:___:___:___:___:___:___ would not [+3 +2 +1 0 -1 -2 -3]

increase the blood level of pain medication in the patient by increasing the medication dosage, increasing the medication frequency or both.
Appendix I(J)

Descriptive Statistics for Each Item of the 50-item PBQ from Study A - Pilot Data

(Item numbers of the 22-item PBQ are in parentheses)
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Reliability coefficients

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n of items = 50

alpha = 0.6439
Appendix I(L)

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Reliability coefficients

n of cases = 57
n of items = 22

alpha = 0.7035
Appendix I(M)

Descriptive Statistics for the 22-item PBQ from Study A Data
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Appendix I(N)

Item-total Statistics for the 22-item

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Reliability coefficients

n of cases = 36
n of items = 22

alpha = 0.8303
Appendix II

The 22-item Pain Beliefs Questionnaire and the Direction in Which Each Item is Scored
PAIN QUESTIONNAIRE

The following questions deal with the clinical management of patient pain. Because each person has their own opinion on the effectiveness of pain management strategies, there are no right or wrong answers. We are interested in your opinion regarding the statements below. Although certain questions may sound similar, each question is unique and important. Please indicate your agreement with each of the statements by circling the number corresponding to your choice under each statement.

1) If the patient appears to be distracted from his/her pain in conversation with the nurse, the pain is probably of low intensity. [agree]

   1  2  3  4  5   6
   strongly disagree

   strongly agree

2) If pain does not subside as expected after medication has been administered, it is probably because of a psychological problem. [agree]

   1  2  3  4  5   6
   strongly disagree

   strongly agree

3) Some real pain has no identifiable physical cause. [disagree]

   1  2  3  4  5   6
   strongly disagree

   strongly agree

4) Patients who keep records of their analgesic intake and request analgesic medications before they are due may have mental health problems. [agree]

   1  2  3  4  5   6
   strongly disagree

   strongly agree

5) Most chronic pain is the result of the patient's anxiety, depression or personality problems. [agree]

   1  2  3  4  5   6
   strongly disagree

   strongly agree
6) As the duration of pain increases, the likelihood that the pain is real decreases. [agree]

1  2  3  4  5  6
strongly disagree

7) Chronic pain is usually psychological as opposed to physiological. [agree]

1  2  3  4  5  6
strongly disagree

8) The maximum analgesic dosage in the range allowed by a physician’s order should be given only rarely. [agree]

1  2  3  4  5  6
strongly disagree

9) Pain medication is most effective if given prior to severe pain onset. [disagree]

1  2  3  4  5  6
strongly disagree

10) Patients frequently "use" their pain to receive special favours or to get out of doing something unpleasant. [agree]

1  2  3  4  5  6
strongly disagree

11) Development of tolerance to narcotic medication is rarely a problem in pain management. [disagree]

1  2  3  4  5  6
strongly disagree

12) Many patients receive inadequate pain management while hospitalized. [disagree]

1  2  3  4  5  6
strongly disagree
13) Chronic pain patients have a lower tolerance for pain than most people. [agree]

1 2 3 4 5 6
strongly disagree

14) Patients ought to tolerate some pain in the interval between analgesic administrations. [agree]

1 2 3 4 5 6
strongly disagree

15) The problem of pain management is too complex to expect that every patient’s pain will be controlled. [agree]

1 2 3 4 5 6
strongly disagree

16) Many patients complain about pain just to get some attention. [agree]

1 2 3 4 5 6
strongly disagree

17) The patient should be the person most in control of his/her total pain management program. [disagree]

1 2 3 4 5 6
strongly disagree

18) In all hospitals there are some patients who experience pain which could have been controlled. [disagree]

1 2 3 4 5 6
strongly disagree

19) Surgery patients ought not to experience severe levels of pain during their hospital stay. [disagree]

1 2 3 4 5 6
strongly disagree
20) There are a number of analgesic and nonanalgesic drugs routinely administered in a hospital setting which are at least as addicting as morphine. [disagree]

strongly disagree disagree 1 2 3 4 5 6 strongly agree

21) Patients should be encouraged to increase their pain tolerance. [agree]

strongly disagree disagree 1 2 3 4 5 6 strongly agree

22) Most chronic pain patients sincerely wish their pain would go away completely. [disagree]

strongly disagree disagree 1 2 3 4 5 6 strongly agree
Appendix III

Information Presented to Subjects

in the Preliminary Study
UNIVERSITY OF SASKATCHEWAN
DEPARTMENT OF PSYCHOLOGY

INFORMATION ABOUT THE RESEARCH STUDY

Name of Researcher: Douglas Jurgens, M.A.

Supervised by: Carl von Baeyer, Ph.D.

Title: An examination of nurses' pain management processes.

Objective: To better understand nurses' pain management processes.

Rationale: Participants' responses on questionnaires inquiring into factors which facilitate or inhibit the administration of narcotic analgesia will provide information which will be used in a future study into pain management processes. As well participants ratings of a pain management vignette will validate its use in the future study.

Procedure: Participants will be asked to list factors which facilitate or inhibit the administration of narcotic analgesia. As well, participants will be asked to rate a pain management vignette on four dimensions. The total time required to complete the materials will be approximately 30 minutes. Participants' confidentiality is assured as no identifying information is required on the questionnaires. A report summarizing the study and its findings will be made available at the institution where the study was completed. Participants wishing to receive information regarding the study and its results may do so by picking up a copy of the summary when it becomes available.

Direct benefits to participants: Participants will benefit from their participation in this research in that they will receive feedback concerning the results of the study. The feedback may provide them with information regarding the pain management practices of study participants. Feedback will be provided through a written report of the results of the study which will be made available at your institution. Notices placed on the wards will alert participants to the availability of the reports.
Possible risks: There is no foreseeable risk associated with participation in this study. You are invited to discuss any concerns you may have with the researcher.

If I have any further questions I may submit them to Dr. Carl von Baeyer, Department of Psychology, University of Saskatchewan, Saskatoon (306-966-6683).

I understand that my participation in this research study is completely voluntary.
Appendix IV

Information Presented to Subjects in the Main Study
Please follow the steps outlined below in completing the enclosed materials.

1) Carefully read the information sheet which outlines the objectives of the study and your contribution.

2) Complete the study materials.

3) Return only the completed study materials in the enclosed stamped and addressed envelope. Please do not return the information sheet with the completed study materials.

Thank you for your participation in this study.

If you have any questions, feel free to contact me.

Douglas Jurgens, M.A.
219 MacDowall Cres.
Prince Albert, SK.

E-mail address: jurgens@sask.usask.ca

Home Phone: (306) 922-6632

Work Phone: (306) 953-3855
UNIVERSITY OF SASKATCHEWAN

DEPARTMENT OF PSYCHOLOGY

INFORMATION ABOUT THE RESEARCH STUDY

Name of Researcher: Douglas Jurgens, M.A.

Supervised by: Carl von Baeyer, Ph.D.

Title: An examination of nurses' pain management processes.

Objective: To better understand nurses' pain management processes.

Rationale: Participants' responses on questionnaires dealing with how they make pain management decisions will provide information regarding these processes.

Procedure: Participants will be presented with a number of questionnaires relating to how they make pain management decisions as well as a questionnaire surveying their beliefs about pain and its management. The total time required to complete the materials will be approximately 45 minutes. Participants' confidentiality is assured as no identifying information is required on the questionnaires. A report summarizing the study and its findings will be made available at the institution where the study was completed. Participants wishing to receive information regarding the study and its results may do so by picking up a copy of the summary when it becomes available.

Benefits to participants: Participants will receive feedback concerning the results which may provide useful and interesting information on the pain management practices of the study group as a whole. A written report of the results of the study will be made available at your institution by September, 1996. Notices placed on the wards will alert participants to the availability of the reports.

Possible risks: There are no foreseeable risks associated with participation in this study. You are invited to discuss any concerns you may have with the researcher.
If you have any further questions you may submit them to Dr. Carl von Baeyer, Department of Psychology, University of Saskatchewan, Saskatoon (306-966-6683).

Your participation in this research study is completely voluntary.
Appendix V

Materials Presented to Subjects

in the Preliminary Study
1. Please list any factors which might facilitate or inhibit the administration of narcotic analgesia for pain. These factors can include past personal or work experiences or factors in the hospital which help or hinder your administration of narcotic analgesia for pain.
INSTRUCTIONS:

On this questionnaire, you will read a description of a hypothetical patient who undergoes a painful abdominal surgical procedure. Read the description carefully and imagine that you are the nurse responsible for the care of the patient. Please imagine that you are at work during a typical shift at your institution and that the patient described in the vignette is one of the usual number of patients that you might care for.

Then answer the questions which follow the description. Use the adjective labels provided and place an "X" towards that end of the scale which best describes your evaluation of the description. The more strongly you feel, the closer you would mark your "X" towards one end of the scale or the other.

There are no right or wrong answers. The results of your participation in this study are confidential and anonymous. Please answer the questions as though the situation described was really occurring as part of your daily nursing duties.

DESCRIPTION

1. You are a nurse working in a primary care system where you are responsible for all aspects of patient pain control (e.g., pain assessment, determining the appropriate dosage of analgesia from within the range allowed for by the prescription and administering the analgesia). You have a new patient, a 30 year old female weighing 65 kg, who, 24 hours earlier, underwent abdominal surgery which is considered to be extremely painful in the post-operative period for most patients. The pain trajectory associated with this procedure causes you to expect the patient to experience severe pain for at least 3 days post-operatively. The prescription order is for morphine 5-15 mg IM q4h prn. You have come on your shift and the nurse who was in charge of the patient informs you that the patient has just been administered 10 mg of morphine and has been complaining of pain during the last shift which is described by the patient as "very uncomfortable". There are no contraindications to providing narcotic analgesic medication in this case and the patient has indicated her willingness to receive such medication.

Please answer this question with regard to the instructions at the top of the page.

1) Are the instructions clear and understandable?

   not clear: very clear
   _____:_____:_____:_____:_____:_____:_____ clear
Please answer the following questions with regard to the description of the patient.

1) How realistic is the above description?
   not realistic _____:_____:_____:_____:_____:_____:_____ very realistic

2) Are the facts presented in the above description consistent with your experience?
   not accurate _____:_____:_____:_____:_____:_____:_____ very accurate

3) Is the information presented in the above description clear or difficult to understand?
   not clear _____:_____:_____:_____:_____:_____:_____ very clear

4) Is the information presented in the above description sufficient to make a decision regarding how you might medicate the patient?
   information sufficient _____:_____:_____:_____:_____:_____:_____ insufficient

Please answer this question with regard to both the instructions and the description.

1) Please make any suggestions you may have for improving the above description and/or instructions in the space provided below. You may refer to the line numbers when making comments regarding the patient description.

________________________________________________________________________
________________________________________________________________________
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________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Appendix VI
Materials Presented to Subjects in the Main Study
INSTRUCTIONS:

On this questionnaire, you will read a description of a hypothetical patient who has undergone a painful surgical procedure. Read the description carefully and imagine that you are the nurse responsible for the care of the patient. Please imagine that you are at work during a typical shift at your institution and that the patient described in the vignette is one of the usual number of patients that you might care for.

Then answer the questions which follow the description. You will be presented with scales in which the adjectives at either end have opposite meanings. Use the adjective labels provided and place your "X" towards that end of the scale which you feel best describes your own feelings in this situation. The more strongly you feel, the closer you would mark you "X" towards one end of the scale or the other.

There are no right or wrong answers. The results of your participation in this study are confidential. Please answer the questions as though the situation described was really occurring as part of your daily nursing duties.

I. DESCRIPTION

You are a nurse working in a primary care system where you are responsible for all aspects of patient pain control (e.g., pain assessment, determining the appropriate dosage of analgesia from within the range allowed for by the prescription and administering the analgesia). You have a new patient, a 30 year old female weighing 65 kg (normal for her height). This patient underwent abdominal surgery 24 hours earlier which is considered to be extremely painful in the post-operative period for most patients. Although you recognize that each patient requires individualized pain assessment, the pain trajectory associated with this procedure causes you to expect the patient to experience severe pain for at least 3 days post-operatively. The prescription order is for morphine 5-15 mg IM q4h prn. You have come on your shift and the nurse who was in charge of the patient informs you that the patient has just been administered morphine 10 mg and has been complaining of pain during the last shift which is described by the patient as "very uncomfortable". There are no contraindications to providing narcotic analgesic medication in this case and the patient has indicated her willingness to receive such medication.

The following questions refer to the above description. Some questions ask you about administering a specific dose of analgesic with an unspecified interval between administrations, while others ask you about administering an unspecified dose of analgesic at a specific time interval. Please note this distinction when you answer the questions which follow.
II. Please indicate how likely you are to perform each of the behaviours listed below.

1. How likely are you, as this patient’s nurse, to administer morphine 15 mg. IM (the maximum dose permitted by the prescription) the next time you medicate the patient?
   unlikely _____:____:____:____:____:____:____ likely

2. As this patient’s nurse, how strongly do you intend (or not intend) to administer morphine 15 mg IM (the maximum dose permitted by the prescription) the next time you medicate the patient?
   strongly intend to _____:____:____:____:____:____:____ strongly NOT TO

3. How likely are you, as this patient’s nurse, to deliver the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?
   unlikely _____:____:____:____:____:____:____ likely

4. As this patient’s nurse, how strongly do you intend (or not intend) to administer the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?
   strongly intend to _____:____:____:____:____:____:____ strongly NOT TO

III. Please indicate how in control you feel with regard to administering morphine 15 mg. IM and how easy you feel it would be to do so.

1. To what extent do you feel in control of administering morphine 15 mg. IM (the maximum dose permitted by the prescription) the next time you medicate the patient?
   not in _____:____:____:____:____:____:____ in control control

2. How easy do you feel it would be to administer morphine 15 mg. IM (the maximum dose permitted by the prescription) the next time you medicate the patient?
   not easy _____:____:____:____:____:____:____ very easy

IV. Please indicate how in control you feel with regard to administering the next dose of morphine IM in four hours and how easy you feel it would be to do so.
1. To what extent do you feel in control of administering the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?

not in control

2. How easy do you feel it would be to administer the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?

not easy

V. Administering morphine 15 mg. IM (the maximum dose permitted by the prescription) the next time you medicate the patient would be:

good

foolish

helpful

VI. Administering the next dose of morphine IM in four hours (the shortest interval permitted by the prescription) would be:

good

foolish

helpful

VII. Most people who are important to me think that I should administer morphine 15 mg. IM (the maximum dose permitted by the prescription) the next time I medicate the patient.

unlikely

VIII. Most people who are important to me think that I should administer the next dose of morphine IM in four hours (the shortest interval permitted by the prescription).

unlikely

IX. To what extent would each of the following factors affect the difficulty of administering morphine 15 mg IM (the maximum dose permitted by the prescription) the next time you medicate the patient?
1. How likely is it that the amount of time you have to complete your duties might prevent you from administering morphine 15 mg IM (the maximum dose permitted by the prescription) the next time you medicate the patient?

unlikely _____:____:____:____:____:____:____ likely

2. How likely is it that your knowledge of narcotic analgesic medications might prevent you from administering morphine 15 mg IM (the maximum dose permitted by the prescription) the next time you medicate the patient?

unlikely _____:____:____:____:____:____:____ likely

3. How likely is it that your own past pain experiences might prevent you from administering morphine 15 mg IM (the maximum dose permitted by the prescription) the next time you medicate the patient?

unlikely _____:____:____:____:____:____:____ likely

4. How likely is it that the patient’s willingness to accept analgesia might prevent you from administering morphine 15 mg IM (the maximum dose permitted by the prescription) the next time you medicate the patient?

unlikely _____:____:____:____:____:____:____ likely

5. How likely is it that the adequacy of documentation regarding the patient’s response to previous analgesic administrations might prevent you from administering morphine 15 mg IM (the maximum dose permitted by the prescription) the next time you medicate the patient?

unlikely _____:____:____:____:____:____:____ likely

X. To what extent would each of the following factors affect the difficulty of administering the next dose of morphine in four hours (the shortest interval permitted by the prescription)?

1. How likely is it that the amount of time you have to complete your duties might prevent you from administering the next dose of morphine IM would increase the difficulty of administering the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?

unlikely _____:____:____:____:____:____:____ likely

2. How likely is it that your knowledge of narcotic analgesic medications might prevent you from administering the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?

unlikely _____:____:____:____:____:____:____ likely
3. How likely is it that your own past pain experiences might prevent you from 
administering the next dose of morphine IM in four hours (the shortest 
interval permitted by the prescription)?

unlikely ____:____:____:____:____:____:____
likely

4. How likely is it that the patient’s willingness to accept analgesia might 
prevent you from administering the next dose of morphine IM in four hours (the 
shortest interval permitted by the prescription)?

unlikely ____:____:____:____:____:____:____
likely

5. How likely is it that the adequacy of documentation regarding the patient’s 
response to previous analgesic administrations might prevent you from 
administering the next dose of morphine IM in four hours (the shortest 
interval permitted by the prescription)?

unlikely ____:____:____:____:____:____:____
likely

XI. How important are each of the following factors in your decision to administer 
morphine 15 mg IM (the maximum dose permitted by the prescription) the next 
time you medicate the patient?

1. How important a factor is the amount of time you have to complete your duties 
in your decision to administer morphine 15 mg IM (the maximum dose permitted 
by the prescription) the next time you medicate the patient?

not ____:____:____:____:____:____:____
very
important

2. How important a factor is your knowledge of narcotic analgesic medications be 
in your decision to administer morphine 15 mg IM (the maximum dose permitted 
by the prescription) the next time you medicate the patient?

not ____:____:____:____:____:____:____
very
important

3. How important a factor is your own past pain experiences in your decision to 
administer morphine 15 mg IM (the maximum dose permitted by the prescription) 
the next time you medicate the patient?

not ____:____:____:____:____:____:____
very
important

4. How important a factor is the patient’s willingness to accept analgesia in 
your decision to administer morphine 15 mg IM (the maximum dose permitted by 
the prescription) the next time you medicate the patient?

not ____:____:____:____:____:____:____
very
important
5. How important a factor is the adequacy of documentation regarding the patient's response to previous analgesic administrations in your decision to administer morphine 15 mg IM (the maximum dose permitted by the prescription) the next time you medicate the patient?

not ______:____:____:____:____:____:____ very important

XII. How important are each of the following factors in your decisions to administer the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?

1. How important a factor is the amount of time you have to complete your duties in your decision to administer the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?

not ______:____:____:____:____:____:____ very important

2. How important a factor is your knowledge of narcotic analgesic medications in your decision to administer the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?

not ______:____:____:____:____:____:____ very important

3. How important a factor is your own past pain experiences in your decision to administer the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?

not ______:____:____:____:____:____:____ very important

4. How important a factor is the patient's willingness to accept analgesia in your decision to administer the next dose morphine IM in four hours (the shortest interval permitted by the prescription)?

not ______:____:____:____:____:____:____ very important

5. How important a factor is the adequacy of charting regarding the patient's response to previous analgesic administrations in your decision to administer the next dose of morphine IM in four hours (the shortest interval permitted by the prescription)?

not ______:____:____:____:____:____:____ very important

Thank you for your careful attention to this questionnaire.
Appendix VII

Free Response Questions Asked of Subjects in the Main Study
I. Please respond to the following questions by providing answers in the spaces provided.

1. Are you encouraged in your institution to pursue pain management strategies other than medication?

   Yes ____    No ____

   If so, please provide a list of some of the alternate pain management strategies encouraged by your institution and your impression of their effectiveness.

   ______________________________________________________

   ______________________________________________________

   ______________________________________________________

   ______________________________________________________

   ______________________________________________________

2. Are you encouraged in your institution to consult others regarding your narcotic analgesic administration decisions?

   Yes ____    No ____

   If so, please provide information regarding how this consultation is achieved.

   ______________________________________________________

   ______________________________________________________

   ______________________________________________________

   ______________________________________________________

   ______________________________________________________
3. Do you feel that there is adequate priority placed on pain management in your institution?
   Yes ___    No ___

   Please comment on the degree of importance associated with the management of pain in your institution.

   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

4. Do you believe that all patient pain can be eliminated?
   Yes ___    No ___

   What is your personal goal with regard to pain management?

   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
5. Do you feel that narcotic analgesic administration practices at your institution are adequate?

Yes ___ No ___

Please comment on how the system could be improved if at all.

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

Thank-you for your participation in this study. Please return only completed study materials in the enclosed addressed envelope.
Appendix VIII

Descriptive Data for the PBQ
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Appendix IX

Item-total Statistics for the PBQ
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