Determinants of nurses' intention to administer opioids for pain relief

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Abstract A statewide cross-sectional survey was conducted in Australia to identify the determinants of registered nurses' intention to administer opioids to patients with pain. Attitudes, subjective norms and perceived control, the key determinants of the Theory of Planned Behavior, were found to independently predict nurses' intention to administer opioids to these patients. Perceived control was the strongest predictor. Nurses reported positive overall attitudes towards opioids and their use in pain management. However, many negative attitudes were identified; for example, administering the least amount of opioid and encouraging patients to have non-opioids rather than opioids for pain relief. The findings related to specific attitudes and normative pressures provide insight into registered nurses' management of pain for hospitalized patients and the direction for educational interventions to improve registered nurses' administration of opioids for pain management.

INTRODUCTION

Pain continues to be a commonly encountered phenomenon in acute care hospitals regardless of the age of the patient or reason for their admission (Nash et al., 1996). Between 45 and 75% of hospitalized patients report experiencing moderate to severe pain despite the technological advances in pain management over the past 20 years (Gu & Belgrade, 1993; Elliott et al., 1996; Ward & Gordon, 1996; Carr & Thomas, 1997; McNeil et al., 1998; Paice et al., 1998). Two major factors have been identified as contributing to the pain reported by hospitalized patients. Registered nurses' (hereafter referred to as nurses) reluctance to administer analgesics, particularly opioids (Brunier et al., 1995; Clarke et al., 1996; Ferrell & McCaffery, 1997; Drayer et al., 1999), and patients themselves compound this problem. Patients are reluctant to request and/or accept medication for their pain and have low expectations of pain relief, demonstrated by the satisfaction they express with their pain management despite experiencing considerable levels of pain (McNeil et al., 1998).

Historically, nurses aspired to reduce rather than to completely relieve pain (Cohen, 1980) and had fixed beliefs regarding the amount of pain patients were expected to experience in association with specific surgery or trauma (Sofar, 1984; Nash et al.,

unpubl. data, 1994) and the appropriate duration of analgesic therapy (Balfour, 1989). A review of the literature between 1988 and 1995 (McCaffery & Ferrell, 1997) identified improvements in nurses' knowledge and beliefs in relation to the addictive qualities of opioids. However, considerable knowledge deficits concerning opioids and their use in pain management (Heath, 1998) and beliefs that patients exaggerate the severity of their pain remain (McCaffery & Ferrell, 1997; Drayer et al., 1999).

Behavior is influenced by the expectations of others (norms), one's ability to perform the behavior and one's control over the intended behavior in addition to holding positive beliefs and attitudes towards the behavior and an adequate knowledge base (Ajzen, 1985). Nurses with positive beliefs, and whose intentions are to completely relieve patients' pain, who are working in an environment where the salient norms are to reduce rather than to relieve pain, will find it difficult to meet their goal. Although nurses' knowledge and beliefs in this area have been thoroughly investigated and educational programs have been developed to address the identified deficits, patients continue to report pain. The influence of the environment in which nurses are working, as well as the nurses' feelings of competence in administering opioids for pain management and their control over pain management have not been investigated. This study addresses this deficit in the research through the utilization of a theoretical framework to examine nurses' intentions and predictors of behavior (Ajzen, 1985) in relation to administering opioids to relieve the pain experienced by hospitalized patients.

THEORETICAL FRAMEWORK

The social cognition model of the Theory of Planned Behavior (TPB) (Ajzen, 1985) was chosen as the conceptual basis for the study because the administration of opioids for analgesia is perceived to be a behavior over which nurses have little volitional control. Intention to perform a behavior is predicted by the person's attitude towards the behavior, the subjective norm or perceived social pressure to perform the behavior and perceived behavioral control, or the person's perception of their control over the performance of the behavior (Ajzen, 1985). The stronger a person's intention to perform a behavior, the more likely the person will perform that behavior (Ajzen, 1991). The central factor in the TPB is the individual's intention to perform a specific behavior even when the behavior is not under volitional (voluntary) control. This theory has successfully predicted nurses' intentions to conduct pain assessments (Nash et al., 1993) and intentions of persons in general to perform a variety of health-related behaviors (McCaul et al., 1993; Terry et al., 1993; Janke, 1994).

FACTORS INFLUENCING NURSES' PAIN MANAGEMENT: A LITERATURE REVIEW

Cognitive factors

Improvements in pain management have occurred very slowly (McCaffery & Ferrell, 1997) despite considerable efforts during the last two decades. Pre-vious research identified nurses' knowledge deficits (Hamilton & Edgar, 1992; Willson, 1992) and exaggerated fears of addiction and respiratory depression and lack of understanding of the principle of scheduling analgesia (McCaffery et al., 1990; Hamilton & Edgar, 1992). Knowledge contributes to the development of beliefs, affecting the salient beliefs and attitudes towards that object (Fishbein & Ajzen, 1975). Nurses' knowledge deficits in relation to pain management and poor knowledge of the benefits of opioids

may cause them to be unduly concerned with the negative attributes of opioids, rather than with patient benefits, for example comfort, mobility and independence. According to the TPB, these negative attributes can influence nurses' salient beliefs and attitudes towards opioids.

Ajzen (1991) and Ajzen and Madden (1986) combined the notions of self-efficacy and perceived control as the concept of perceived behavioral control. Self-efficacy can influence motivation (Bandura, 1977) and preceived control can have a direct influence over behavior (Ajzen & Madden, 1986). In uncomplicated tasks, self-efficacy is a distinctive predictor of intention; for example, engaging in dental brushing and flossing and breast and testicular self examination (Ronis & Kaiser, 1989; McCaul et al., 1993; Terry et al., 1993). Additionally, women's perceived control over their weight loss predicted their intention to lose weight (Schifter & Ajzen, 1985) and undergraduate students' perceived control over their ability to attend class predicted their intention to attend class (Ajzen & Madden, 1986). In more complex behaviors, perceived control independently predicted nurses' intention to perform pain assessments (Nash et al., 1993). Pain management is a complex nursing activity involving not only the nurses' knowledge and attitudes but also their self-efficacy in negotiating the administration of appropriate pain-relieving medication and their belief that they have control over their actions. These factors may be an important determinant of nurses' intention to administer opioids.

Social factors

Medical staff prescribe the opioids; nurses, in collaboration with another nurse or a medical officer, determine when to administer them. This necessary interaction may deter nurses from administering opioids 'as required' (p.r.n.). Additionally, negotiations may be unsuccessful as a result of a lack of assertiveness or poor negotiating skills. Normative pressures from patients, peers, medical staff and ward, in addition to hospital demands influenced by the health care system, may strongly influence nurses' intention and behavior.

Behavioural factors

Nurses' beliefs, attitudes, subjective norms, and perceived control of the administration of opioids are demonstrated by their behavior and effective p.r.n. opioid administration. A study by Balfour (1989) found only 43% of nurses would administer opioids for analgesia to post-operative or trauma patients for a maximum of 3 days, 16% would cut back the first day following surgery, and 78% would consider reducing opioids after 3 days. Nurses are more likely to accept reports of pain from grimacing rather than from smiling patients and believe patients on opioid treatment for 36 months to be at greater risk of addiction than those taking opioids for 13 days (McCaffery & Ferrell, 1997). These studies suggest that patients may not be receiving adequate analgesics from nurses and that nurses' reluctance to administer opioids for analgesia may be influenced by a range of beliefs, attitudes and norms, preventing effective pain management.

This paper presents data from the first phase of a two-phase study exploring patient and nurse related beliefs, attitudes, norms, control and intentions that may be acting as barriers to effective pain management for hospitalized patients. It was not within the

scope of this study to measure nurses' opioid administration behavior; therefore, following the tenets of the TPB (Ajzen, 1985), intentions were used to predict behavior.

AIMS OF THE STUDY

The aims of the study were to:

Examine the possible underlying determinants of nurses' intention to administer p.r.n. opioids for analgesia.

Develop a predictive model for nurses' intention to administer p.r.n. opioids for analgesia.

On the basis of the literature reviewed, it was hypothesized that:

The key elements of the TPB (attitudes, subjective norms and perceived control) would predict a significant proportion of the variation in nurses' intention to administer p.r.n. opioids for analgesia.

Perceived control would be the strongest predictor of nurses' intention to administer p.r.n. opioids for analgesia.

METHOD

Study design

A statewide cross-sectional self-report study design was employed in Queensland, Australia.

Participants

Level 1, 2, or 3 registered nurses, who were members of the largest professional nursing organization in the state (approximately 60% of nurses in the state) and were employed in either a public or a private sector hospital, were the target population for this study. The 11 945 identified nurses were stratified according to level and sector. To provide a representative sample, 1 in 15 (a total of 800) were then randomly selected and became the target sample for this phase of the study. In Queensland:

Level 1 nurses are registered nurses responsible for providing direct care for a specific patient population.

Level 2 nurses are registered nurses with additional clinical responsibilities (e.g. orientation and preceptorship of new staff, staff development and research).

Level 3 nurses are registered nurses who coordinate care for a patient unit and collaborate with nurse educators and nurse researchers to facilitate quality care.

Four hundred and forty-six (55.75%) nurses completed and returned the self-report questionnaire. Of these, the primary area of clinical experience was surgical/peri-operative (29.4%); medical (19.5%); critical care/accident and emergency (13%); midwifery (11.9%); mental health (6.7%); oncology (5.6%); gerontology (4.9%); pediatrics (3.6%); and general nursing (5.4%). Therefore, the majority of respondents were experienced in areas of nursing where pain management was an important aspect of their role (e.g. nurses working in a surgical/peri-operative area would be experienced in the management of surgical pain). Overall, the response rates from public and private sectors were similar and the only difference between levels was a greater response from Level 2 nurses in the private sector. It was not within the scope of this paper to investigate differences between nurses working in these different areas, practising at different levels or in different sectors of the health care system. Therefore, the results are presented together.

Self-report instrument

A self-report instrument, the Pain Management Survey, was specifically developed and used to collect data from the sample. The development of this instrument occurred in four stages. Initially, literature searches were undertaken to determine current national and international opinion concerning the beliefs and attitudes of nurses about patients' pain, the administration of opioids in pain management and the TPB. As suggested by Ajzen and Fishbein (1980), focus group interviews were conducted to elicit the salient beliefs of practising nurses regarding pain and pain management. Information was then drawn from both sources and used to formulate a questionnaire that was piloted and, after some modification, named the Pain Management Survey.

The Pain Management Survey consisted of items designed to:

Collect information on nurses' direct attitudes towards pain relief and administration of p.r.n. opioids for analgesia.

Measure the constructs contained in the TPB as they applied to nurses and their administration of p.r.n. opioids for analgesia (beliefs, subjective norms, perceived control and intention).

Collect demographic data.

Direct attitudes towards pain relief and opioids

Twenty-eight items were developed to address issues identified from the literature and focus group data. These items targeted information regarding nurses' general attitudes towards pain relief, opioids and their administration. They were measured on a 5-point Likert scale from 1 (strongly agree) to 5 (strongly disagree). Formation of a direct attitude scale was achieved as a result of a principal components factor analysis with a varimax rotation on the 28 items and an examination of the item intercorrelations and the internal consistency of the nine items which loaded onto the first extracted factor (Cronbach's = 0.78). The nine items are shown in Table 1. A

direct attitude score was calculated by the summation of each individual's score for the set of items in the scale; a high score reflected a positive attitude.

▪Patients with a history of opioid addiction should not be given opioid analgesics for pain.
▪If an opioid analgesic is ordered every 4 hours, nurses should instruct patients who report pain during that 4 hours to wait until their medication is due.
▪In general, children should not receive opioid analgesics.
▪It is best to administer the minimum amount of opioid analgesic.
▪In general, elderly patients should not receive opioid analgesics for pain.
▪Opioid analgesics should not be administered for longer than 3 days post-operatively.
▪It is usually best to begin with non-opioid analgesics when trying to relieve pain of any type.
▪In general, patients should be encouraged to have non-opioid pain relief rather than opioid analgesics.
▪Addiction is likely to occur as a result of treating pain with opioid analgesics.

Table 1. Direct attitudes toward pain relief and opioids

Measurement of TPB constructs

Measurement and scoring of the components of nurses' behavioral factors were conducted according to the TPB and associated model described by Ajzen (1985). All items in this section were measured on a 1 (likely, desirable) to 7 (unlikely, undesirable) scale. Prior to data analysis participants' responses were converted to a 7-point scale from + 3 (likely, desirable) to 3 (unlikely, undesirable) in accordance with Ajzen and Fishbein's theoretical model (Ajzen & Fishbein, 1980).

Two groups of items were developed from the information provided by the focus groups to measure beliefs (e.g. 'When you administer p.r.n. opioid analgesia, how likely is it that the following consequences will occur for the patient?') and to evaluate these beliefs (e.g. 'How desirable do you feel each of the following consequences would be for a patient who had received p.r.n. opioid analgesia?'). Three positive and three negative consequences were included. An indirect attitude score was calculated by multiplying each belief score by the corresponding evaluation score and then summing across the six products.

The most common referents identified from the focus group data were patients, nursing colleagues, patients' families and medical staff. Two groups of items were developed to address the identified referent's influence on opioid administration, called normative beliefs (e.g. 'In general, how likely is it that your nursing colleagues would think that you should administer p.r.n. opioid analgesia to a patient in pain?'),

and the effect of this influence on the motivation of the respondents to comply with the referent's request (e.g. 'In general, how likely are you to go along with the wishes of your nursing colleagues?'). A subjective norm score was calculated by summing the cross products of the corresponding scores on the measures of normative beliefs and motivation to comply.

Focus group data identified perceived control beliefs about ward expectations, route of administration, type of pain and patients' conditions and characteristics. Two groups of items were developed to measure the effect of these five control beliefs on nurses' administration of p.r.n. opioid analgesics (e.g. 'How much effect do ward expectations have on whether you administer p.r.n. opioid analgesia to a patient with pain?') and the degree of consideration given to these beliefs prior to the administration of p.r.n. opioids (e.g. 'How often do you consider ward expectations prior to administering p.r.n. opioid analgesia to a patient with pain?'). To measure these responses, a 7-point scale, where 1 = a great deal/ very often and 7 = none at all/not very often, was used. An indirect control score was calculated by summing the cross products of the corresponding scores on the measures of control beliefs and degree of consideration.

As in Ajzen and Madden's (1986) study, three items were developed to measure direct control (e.g. 'How much control do you believe you have in administering p.r.n. opioid analgesia to a patient?'). These items were measured on a 7-point scale from 1 (complete control, extremely easy) to 7 (no control at all, extremely difficult). A direct control score was calculated by summing across the three items.

According to Schifter and Ajzen (1985), the behavioral intention component of the theory was measured through three direct questions concerning the probability of the respondent administering p.r.n. opioids when next caring for a patient (e.g. 'I intend to administer p.r.n. opioid analgesia when next caring for a patient with pain.'). These items were again measured on a 7-point scale from 1 (likely, strongly agree) to 7 (unlikely, strongly disagree). An intention score was also calculated by summing across the three items.

Cronbach's coefficients for the measures described above are shown in Table 2. The moderate coefficients for the belief-based measures were not unexpected as the measures incorporate a range of different beliefs. Therefore, they may not be internally consistent (Ajzen & Madden, 1986).

Variable	Mean ± SD	Possible range	α
Direct attitude	31.70 ± 5.40	9–45	0.78
Belief-based attitude	24.82 ± 12.75	–54–54	0.61
Subjective norm	11.68 ± 9.38	–36 36	0.67
Indirect control	18.55 ± 12.05	–45 45	0.53

Variable	Mean ± SD	Possible range	α
Direct control	5.46 ± 3.10	9 9	0.68
Intention	5.58 ± 3.39	9 9	0.79

Table 2. Scales from the pain management survey

Procedure

The Pain Management Survey was mailed by the state nursing organisation to the 800 randomly selected nurses. The mailout included a letter of invitation to participate in the research and a reply-paid envelope. Three weeks later, using the same mailing service, a reminder letter was mailed to each participant.

RESULTS

Attitudes and beliefs towards opioids and their administration

The direct attitude scale, showing nurses' willingness to administer opioids, consists of nine items with a possible range of 945 and an actual range of 1345 (31.7 ± 5.4 : $\bar{X}$ ± SD) (Table 2). Respondents' attitudes towards opioids and their administration to patients with pain were generally positive; that is, more than half the respondents gave positive answers to each of these items. However, responses to particular items highlighted the presence of negative attitudes that could have a major influence on nurses' pain management. Nearly 40% of respondents did not agree that, in general, children and patients with a history of opioid addiction should be given opioids for pain relief. Over 20% agreed or were unsure whether patients who ordered analgesics every 4 h and reported pain within those 4 h should have to wait until their pain relieving medication was due. One-third (32.8%) of respondents considered opioids should not be required for longer than 3 days post-operatively and nearly 20% were unsure about this. Nearly half (47.8%) felt that, in general, patients should be encouraged to have non-opioids rather than opioids for pain relief. Just over one-third (36%) agreed it was best to administer the least possible amount of opioids.

The range, mean and standard deviation for the belief-based attitude, subjective norm, indirect control, direct control and behavioral intention scores are displayed in Table 2. Respondents' belief-based attitudes were positive overall; however, responses to some individual items again highlighted negative attitudes. The majority of nurses (94%) believed opioids would increase patient comfort; however, only two-thirds believed they would increase independence and mobilization for patients. Most believed patient comfort to be desirable (98%), along with increased independence (82%) and mobility (85%). Only 7% believed opioids to be addictive and 11% were unsure of this. Eighty-eight percent of nurses believed it to be undesirable for patients to become addicted following the administration of opioids. One-third believed patients given opioids would experience side-effects and 78% believed this to be undesirable. Eighty-four percent believed it to be undesirable for patients to have

inadequate pain relief, and, interestingly, 20% believed this to be possible, even if patients were given opioids.

The subjective norm scores suggest respondents, to a degree, perceived that their identified referents (patients, nursing colleagues, friends, relatives and medical staff) thought they should administer p.r.n. opioids to a patient with pain. Approximately 80% believed their referents thought they should administer opioids to patients with pain. Interestingly, there was variation in nurses' compliance with the wishes of these referents. They were more likely to comply with the wishes of patients (94%) and medical staff (86%) than with those of their colleagues (68%) and patients' families (54%).

In general, the direct and indirect control scores suggest that respondents perceived nurses to have some control over the administration of p.r.n. opioids. Just over 80% believed it was easy for them to administer opioids and that it was within their control. With regard to specific control beliefs, more nurses said the type of pain the patient experienced (95%) and the patient's condition (84%) would have a greater influence on their pain management decisions than the ward expectations (40%), route of administration (43%) or patient's characteristics (46%). Similarly, when considering whether to administer opioids, more nurses said they would consider the type of pain the patient experienced (94%) and the patient's condition (91%) than ward expectations (43%), route of administration (65%) and patient characteristics (61%).

Respondents indicated a positive intention to administer p.r.n. opioids to patients with pain. Eighty-seven percent said it was likely that they would try to administer opioids when next caring for a patient who had pain. However, only 74% intended to do this.

While these results suggest nurses have overall positive intentions towards and beliefs about the administration of p.r.n. opioids, responses to some individual items highlight negative attitudes that are likely to influence nurses in their practise.

Building the predictive model of nurses' intention

In order to develop a model to predict nurses' behavioral intention to administer p.r.n. opioids a standard multiple regression was performed between the dependent variable, 'intention', and the five independent variables. Thirty-nine percent of the variation in intention scores was explained by the independent variables, $F(5, 440) = 56.7$, $P < 0.01$. Although small, the independent contributions made by direct control ($sr2 = 0.30$), subjective norm ($sr2 = 0.26$), direct attitude ($sr2 = 0.21$), and belief-based attitude ($sr2 = 0.12$) were significant. As these have not previously been considered important predictors in nurses' management of pain, their contribution to nurses' intention is of importance. These results highlight the probability that nurses' intention to administer opioids was stronger when they had a high degree of direct control over the administration of opioid analgesics, experienced normative pressure to administer opioids or reported positive attitudes and beliefs.

Correlations between the five independent variables were examined and found to be low, ranging from 0.07 to 0.29. To further improve the model (see Fig. 1) indirect control was eliminated, as it provided no unique contribution to the prediction of

intention. A standard multiple regression was performed. The R of 0.63 was significant, $F(4, 441) = 70.8$, $P < 0.01$, with 39.1% of the variability in intention scores predicted from direct attitude, indirect belief-based attitude, subjective norm and direct control scores. All variables were significant independent contributors to intention ($P < 0.01$); however, the strongest predictor was direct control.

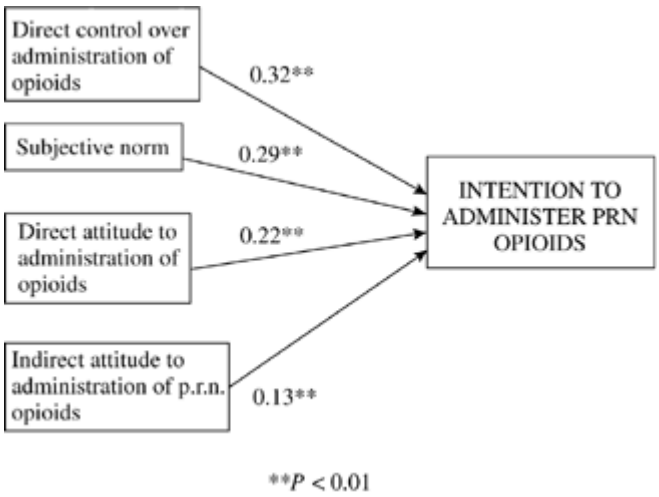

Figure 1. Predictive model of nurses' intention to administer opioids to patients with pain.

The model suggests that nurses with a high degree of perceived direct control and positive attitudes and beliefs are not influenced by negative normative pressures to administer p.r.n. opioids. These nurses have a greater intention to administer p.r.n. opioids for analgesia than nurses with less perceived direct control and more negative attitudes and beliefs, as this second group are influenced by negative normative pressure. Further to this, the model suggests that the degree of direct control perceived by nurses may be the most influential factor in their intention to administer opioids.

DISCUSSION

As hypothesized, the key determinants of nurses' intention to administer p.r.n. opioids for analgesia were beliefs, attitudes, subjective norms, and perceived behavioral control. These key determinants of intention have not been previously evaluated in relation to nurses' pain management. Therefore, the significant proportion, nearly 40%, of the variation in intention accounted for by the determinants, although small, is of considerable importance as a predictor in nurses' pain management. The Predictive Model of Intention developed from this study supports the TPB.

These findings indicate nurses' beliefs and attitudes towards opioids, subjective norms relating to the administration of opioids and perceived control over their administration play a significant role in nurses' intention to administer opioids to patients with pain. While these findings are important, it is equally important to continue to explore factors contributing to the unexplained 60% of the variation in nurses' intention in relation to these predictors. Such factors could include: nurses' pain management knowledge; past experience with pain, both personal and

professional; and years of nursing experience and/or level of practise or an interaction of these variables with each other and/or the variables of the TPB. Some of these factors (e.g. knowledge) have been investigated by many researchers, but not in relation to the predictors discovered during this study.

Intention

Intention is deemed to predict behavior (Ajzen & Madden, 1986). Nurses in this study reported positive intention to administer p.r.n. opioids for analgesia and thought they had control over this action. Therefore, patients cared for by these nurses could expect to be pain-free or at least to have their pain well managed. However, in two of the major metropolitan hospitals of the state where some of these nurses were employed, Nash et al. (1996) found that approximately 60% of medical, surgical and oncology patients had experienced pain in the 24 h prior to being surveyed and, of these, 26% reported their pain as 'distressing, horrible or excruciating' (moderate to severe). Although these percentages are high, they are lower than those found in an earlier study by these authors, with a similar, although smaller, sample, 79% and 33% respectively (Nash et al., unpubl. data, 1994). This reduction in the number of patients reporting pain is similar to that reported in the literature review (McCaffery & Ferrell, 1997). However, in the previous studies by the authors the percentages of patients experiencing moderate to severe pain were similar (Nash et al., unpubl. data, 1994; Nash et al., 1996). The seemingly contradictory nature of the findings from these recent patient and nurse studies (i.e. nurses' positive intentions to administer opioids versus patients' reports of moderate to severe pain) highlights the complex nature of pain management and the need for its continued study.

Are nurses unaware of the level of pain experienced by their patients? Patients prefer not to be given drugs for pain relief (Wilder Smith & Schuler, 1992) and many (36%) do not report pain (Nash et al., 1996); therefore, nurses with the best intentions may not administer p.r.n. opioids to these patients. Patients expect nurses to know whether they need medication and often only admit to pain when questioned in depth and often indirectly by the nurse (Donovan et al., 1987; Nash et al., 1996).

Nurses' reports of intention to administer opioids may not be reports of actual intention but socially desirable intention. The nurses' role is to protect patients from harm (Agency for Health Care Policy and Research, 1992a). Pain is a harmful experience; therefore, nurses responding to the survey may have underlying beliefs that they should administer opioid pain relief and hence report positive intention.

Perceived control

As in previous studies (McCaul et al., 1993; Nash et al., 1993; Terry & O'Leary, 1995), perceived control was demonstrated to be the strongest independent predictor of intention, highlighting the importance perceived control and self-efficacy play in determining nurses' intention. Nurses do have control over the p.r.n. administration of opioids; however, over one-third thought it best to administer the least amount of opioid and nearly half would encourage patients to have non-opioid rather than opioid analgesics. Therefore, although nurses perceive themselves to have control over pain management and intend to administer p.r.n. opioids, their intention may be to reduce rather than to completely relieve patients' pain. This area needs further exploration.

Attitudes

Although nurses reported positive attitudes towards opioids and positive belief-based attitudes towards pain and pain management with opioids, the results from specific items were quite revealing, confirming McCaffery and Ferrell's (1997) findings. Although there has been some improvement in nurses' management of pain during the past 25 years, nurses continue to have misconceptions that cause them to doubt patients' reports of pain. Many nurses do not regard patients' pain reports as the single most important reliable indicator of pain, remain reluctant to increase a safe but ineffective dose of morphine and are concerned about addiction.

One-third of the nurses in this study stated they would administer the least possible amount of prescribed p.r.n. opioid to a patient in pain and nearly half believed patients should be encouraged to have non-opioids rather than opioids. Explanations for these behaviors may be gleaned from nurses' reported lack of confidence in the ability of opioids to relieve pain and concerns about addiction, the side-effects of opioids and the undesirability of these side-effects. These negative attitudes may persuade nurses not to administer them and/or those who do administer opioids may aspire to reduce rather than to relieve pain. These findings parallel those from studies since 1980 (Cohen, 1980; Weis et al., 1983; McCaffery & Ferrell, 1997) and highlight the urgent need for nursing as a profession to identify the source of these attitudes and stem their propagation.

Negative attitudes are reinforced through nurses' beliefs relating to the appropriate length of opioid administration post-operatively, the required time between doses and patient benefits from opioids. One-third believed opioids to be required for only 3 days post-operatively and 20% would wait the required 4 h before administering the next dose. Patients who have been administered a low, inadequate dose of opioid may experience significant pain prior to the prescribed 4 h. Most nurses considered it beneficial for their patients to be more comfortable, independent and mobile. However, although most believed the administration of p.r.n. opioids would increase patient comfort, one-third did not believe this action would also increase patient independence and mobility.

Belief that p.r.n. opioids increase comfort fosters their administration. Conversely, disbelief in the other key benefits of opioid administration, independence and mobility, does not contribute to its administration. This also promotes patients' reliance on nurses for assistance with mobilising and activities of daily living and increases the risks of complications associated with hospitalization, particularly in the elderly (Garrett, 1992).

Beliefs about who should and should not receive opioids influence practise and intention. Nearly half the nurses (40%) did not agree that children and patients addicted to opioids should receive opioids for pain relief. Given that nearly two-thirds of the nurses (61%) consider patient characteristics when deciding whether to administer opioids, this could be an important factor contributing to patients' pain. Further research needs to investigate the decision-making processes used by nurses, examining the effects of these decisions on pain, hospitalization and post-hospital experiences.

Subjective norms

Most nurses perceived their referents to view positively the administration of p.r.n. opioids. They were more likely to comply with requests from patients (94%) and medical staff (86%) than with requests from colleagues (68%) and patients' relatives or friends (54%). Nurses following McCaffery's 1968 advice, 'Pain is whatever the experiencing person says it is . . .' (McCaffery & Beebe, 1989), are using the patient as their main referent when determining a patient's level of pain and need for pain relief. This practise has been reinforced during the past decade through the clinical practise guidelines for pain management (Agency for Health Care Policy and Research, 1992b; American Pain Society, 1992; Jacox et al., 1994).

However, patients do not report pain (36%) (Nash et al., 1996) and are prepared to tolerate significant levels of pain (Nash et al., unpubl. data, 1994). If patients do not inform nurses of the pain they are experiencing, then the nurses caring for them, unaware of their pain and/or its level of severity, are unable to appropriately manage this pain. In these instances, the best intentions and control over pain management are useless. This highlights the urgent need to improve patient education relating to pain and pain management with opioids, and for nurses to use a variety of referents and objective information when identifying patients' pain and their pain relief requirements. For example, family members may be more aware than nurses of the patient's stoic pain-related behavior. To encourage patients to report pain, intensive pain management education will need to be conducted. This education should target the need for patients to report pain, how pain medications work, how they should be taken and the likelihood of addiction as a side-effect of opioid usage for pain management. These educational sessions need to be conducted a number of times, for example at pre-admission clinics, on admission to hospital and both pre- and post-operatively. Education of the general population in relation to pain management would assist patient education and could be undertaken as a public health initiative.

Normative influences might be responsible for nurses' negative beliefs about opioids. Such beliefs include: That it is better to administer the least amount of opioid ordered; that it is preferable for patients to have non-opioids rather than opioids (current study); that opioids should only be required for a maximum of 3 days post-operatively (Balfour, 1989); and that there is an increased likelihood of addiction the longer patients receive opioids (McCaffery & Ferrell, 1997). To change these and other inappropriate ward norms, nurses in a supportive peer environment need to identify the ward norms that are influencing their practise. This could be achieved through guided ward group discussions where nurses identify, analyze and make plans to change inappropriate ward norms. Then through peer support nurses will develop positive ward norms regarding the administration of p.r.n. opioids.

Limitations of the study

As the nurses participating in this study did so voluntarily, the results might be skewed and not representative of all nurses practising in the state. Did the 55% of the targeted nurses who completed the questionnaire have a particular interest in pain management? Many reported positive intentions towards the administration of p.r.n. opioids. Are those nurses who did not respond more representative of the nurses

responsible for the pain experienced by hospitalized patients? To explore this possibility, future research needs to examine patients' pain experiences and nurses' attitudes, intention and behavior within the same setting.

The measures for indirect control may not have been a real measure of indirect control, but may have replicated other variables. The items used (e.g. ward expectations, patient's condition, and patient characteristics) may not accurately represent indirect control beliefs, but may measure belief-based attitudes and norms. Significant, although weak, correlations were found between indirect control and subjective norm, and indirect control and belief-based attitude. Therefore, further development of these items to measure indirect control may improve this variable's predicability.

CONCLUSIONS

Perceived control, positive attitudes and subjective norms are predictive factors in nurses' intention to administer opioids to hospitalized patients with pain. Many specific negative attitudes preventing nurses' use of opioids for pain management were identified. There is an urgent need to identify the origin and mode of the spread of these negative attitudes and to ensure that environments where nurses care for patients with pain support effective pain management. Many seemingly independent nursing actions require complex interactions with a number of people prior to their performance. Negative normative pressures might impede opioid administration by nurses with perceived control and positive attitudes, regardless of their positive intention. Additionally, nurses may be unaware that patients, their primary referents, are reluctant to report pain (Nash et al., 1996; Drayer et al., 1999; de Rond et al., 2000).

This study highlights the need for programs aimed at changing nurses' behavior to acknowledge the complexity of nursing activities and to base educational intervention on a theoretical foundation. Based on the theoretical framework used in this study, educational programs to improve pain management need to employ a collaborative approach to pain management with opioids. They need to be broad based, to incorporate factors identified in this study and to continually monitor their level of success in reducing the pain their patients experience. These programs need to target all ward staff in order to change subjective norms and attitudes, not simply interested groups of nurses. Further research needs to identify the predictors that account for the 60% variation in intention not identified by the TPB.

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