National Library of Canada
Acquisitions and Bibliographic Services Branch
395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale du Canada
Direction des acquisitions et des services bibliographiques
395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

Canada

UNIVERSITY OF ALBERTA

NURSE EDUCATORS' KNOWLEDGE AND DECISIONS RELATED TO MANAGEMENT OF ACUTE POST-OPERATIVE PAIN WITH OPIOID ANALGESICS

BY

BEV WILLIAMS

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF NURSING

FACULTY OF NURSING

EDMONTON, ALBERTA

FALL, 1992

ISBN 0-315-77242-5

UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: BEVERLY ANN WILLIAMS

TITLE OF THESIS: NURSE EDUCATORS' KNOWLEDGE AND DECISIONS RELATED TO THE MANAGEMENT OF ACUTE POST-OPERATIVE PAIN WITH OPIOID ANALGESICS

DEGREE: MASTER OF NURSING

YEAR THIS DEGREE GRANTED: 1992

Beverly Ann Williams

BEVERLY ANN WILLIAMS
8351 81 AVE.
EDMONTON, AB T6C 0W1

DATE: Aug 6, 1992

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

THE UNDERSIGNED CERTIFY THAT THEY HAVE READ, AND RECOMMEND TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH FOR ACCEPTANCE, A THESIS ENTITLED NURSE EDUCATORS KNOWLEDGE AND DECISIONS RELATED TO THE MANAGEMENT OF ACUTE POST-OPERATIVE PAIN WITH OPIOID ANALGESICS. SUBMITTED BY BEV WILLIAMS IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF NURSING.

.....

DR. J. LANDER, SUPERVISOR

.....

DR. A. MOLZAHN

.....

DR. H. NORTHCOTT

DATE: June 22/92.

Abstract

It is common for many post-operative patients to experience inadequate pain management. The failure of physicians and nurses to apply basic knowledge is a major factor in poor management of acute pain. Basic education programs may have failed to provide practitioners with adequate information. For this reason, a study was planned to assess nurse educators' knowledge and clinical decisions about acute pain management. Perceptions about pain management content in nursing curricula were also examined. After pretesting, a survey questionnaire was mailed to the total population of 320 educators in the province of Alberta, Canada. Educators worked in either diploma (hospital or community college based) or degree programs (university based). A 50% (n=158) response rate was obtained. The response rate was consistent with that observed in other studies conducted in the province. The sample included proportionate representation from educators employed in diploma and degree programs. Therefore no sampling bias was detected. Educators were found to lack fundamental knowledge about the pharmacological management of acute pain with opioid analgesics and many were aware of this deficiency. Although educators did make some appropriate clinical decisions about pain management, their decisions were not based on accurate knowledge. There were no significant differences among programs in nurse educators' knowledge or the accuracy of their clinical decisions. Educators reported their curricula contained little content related to pain management and many were aware of this deficiency. They also reported that students were not well prepared to manage pain in the clinical setting on graduation. If nurse educators lack knowledge, they are unlikely to provide students with accurate information. Therefore nurse educators must be encouraged to learn and transmit findings arising from clinical pain research. Changes are also required in basic education programs including the identification of essential content, development of effective strategies for presentation and follow-up of students in the clinical areas.

Students must also be provided with strategies to contend with the potential conflict they may encounter with colleagues whose information may not be current. Suggestions for further research were detailed. Nurse educators were concerned about the topic of pain and pain management and it is this concern that might precipitate changes in future nursing education. The ultimate measure of educational success will be patient reports of decreased uncontrolled pain.

Acknowledgements

I would like to extend my appreciation to those who made this study possible.

To Dr. Janice Lander, my advisor, for her infinite patience, willingness to share her wisdom, and her ability to critique in an encouraging way.

To Dr. Anita Molzahn, a member of the committee for her interest, encouragement and suggestions.

To Dr. Herb Northcott, an external committee member for his sense of humor and thought provoking comments and questions.

To all those nurse educators across Alberta who responded to the survey.

To Mr. Chuck Humpheries for his encouragement and willingness to share his expertise about statistical packages and program use.

To Agnes van der Klaauw who so freely supported me and helped me maintain perspective.

To my family: my husband Owen for his unerring support, his ability to create quiet time and his reminders to believe in myself.I would also like to thank my sons, Dan and Mike for understanding when Mom needed quiet time. I could not have done it without the support of the three of you!

Table of Contents

List of Tables

Educators' Knowledge and Decisions Related To The Management of Acute Post-operative Pain with Opioid Analgesics

Bev Williams BScN, MN Candidate
University of Alberta

The study of pain mechanisms and management has generated a substantial body of knowledge over the last twenty years. It is reasonable to expect that such an increase in knowledge would benefit patients in pain. However, recent reviews of the literature (for example, Appendix A) have uncovered reports to the contrary; pain in hospitalized individuals is persistently undertreated and moderate to severe uncontrolled pain is typical (Cohen, 1980; Marks and Sachar, 1973; Weis, Sriwatanakul, Alloza, Weintraub & Lasagna, 1983).

Acute pain may be treated pharmacologically with analgesic drugs and moderate or severe acute pain often requires opioid analgesics. When administered appropriately, opioid analgesics can indeed relieve acute pain. However, there is strong evidence that despite advances in knowledge, opioid analgesics are not being administered effectively (Cohen, 1980; Marks & Sachar, 1973; Weis et al, 1983).

Researchers have suggested a number of problem areas that could contribute to the undertreatment of acute pain in hospitalized patients. The following are of central concern in this paper: (1) fear of addiction; (2) limited knowledge about the interaction of opioids with other medications; (3) inaccurate knowledge about doses and duration of opioids; and (4) use of pro re nata (PRN: as required) regimes for opioid adminstration instead of routine administration (at regular intervals around the clock).

Health professionals' fear of addiction was initially addressed by Marks and Sachar (1973). They found that this fear of addiction was responsible for reluctance to treat pain with opioid analgesics. Although the development of addiction is rare in patients with no previous history of addiction (Porter & Jick, 1980; Twycross, 1984), both physicians and

nurses overestimate the risk (Cohen, 1980; Ketovuori, 1987; Lander, 1990; Sriwatanakul, Weis, Alloza, Kelvie, Weintraub, & Lasagna, 1983; Twycross, 1984; Winefield, Katsikitis, Hart, & Rounsefell, 1990). This is reflected in the underprescription of opioids by physicians (Grossman & Sheilder, 1985; Marks & Sachar, 1973; Twycross, 1984) as well as the infrequent administration of opioids by nurses (Cohen, 1980; Ketovuori, 1987; Marks & Sachar, 1973; Sriwatanakul et al., 1983; Twycross, 1984). Nurses also tend to select the lowest dosage even if it does not produce the desired relief of pain (Cohen, 1980; Ketovuori, 1987; Marks & Sachar, 1973).

In addition, many physicians and nurses attribute opioid analgesia to be the cause of respiratory depression (Cohen, 1980; Weis et al., 1983). Clinically relevant respiratory depression is rarely seen in patients with severe pain even when receiving large doses of opioids (Twycross, 1984). This is because the pain and any accompanying anxiety are powerful antagonists to opioid induced respiratory depression (Cohen, 1980; Twycross, 1984; Watt-Watson, 1987).

The second problem area relates to the interaction of opioid analgesics with various other medications. Many physicians and nurses are unaware of the toxic interaction of meperidine and MAO inhibitors or the beneficial interactions which may occur following concurrent administration of opioid analgesics and tricyclic antidepressants (Charap, 1978; Fox, 1982). They may also hold false beliefs that the interaction of some drugs with analgesics will result in improved analgesia. For example, physicians and nurses have been reported to believe that promethazine increases the efficacy of opioid analgesics although this is not supported by research (Charap, 1978; Marks & Sachar, 1973; Weis et al., 1983).

Another area of concern is the inaccuracy of knowledge about correct doses and duration of action of opioid analgesics among both physicians and practising nurses (Charap, 1978; Cohen, 1980; Ketovuori, 1987; Marks & Sachar, 1973; Romyn, 1990; Watt-Watson, 1987). The findings of one study indicated that student nurses lacked knowledge about the duration of

action of common opioid analgesics and potential drug interactions that could occur. In addition, students' decisions regarding administration of opioid analgesics were not based on accurate knowledge (Romyn, 1990).

Finally, results of several studies indicate that PRN administration of opioid analgesics remains common, despite recommendations for routine administration of analgesics in the management of acute pain (Charap, 1978; Cohen, 1980; Marks & Sachar, 1973; Twycross, 1984). Part of the rationale underlying the routine administration of opioid analgesics in the management of pain is the prevention of the cyclic recurrence of pain and anxiety related to unstable blood levels of the drug. While most nurses are able to identify anxiety as a major factor influencing pain medication requirements, they fail to recognize that PRN administration of analgesics frequently forces patients to experience pain and anxiety before the next analgesic is due. Consequently, analgesic requirements escalate (Charap, 1978; Twycross, 1984).

It is evident that nurses contribute to the poor management of acute pain. Inadequate pain management is often thought to arise from deficiencies in practitioner knowledge about pain and pain management (Cohen, 1980; Fox, 1982; Watt-Watson, 1987). The literature suggests that education is a key factor in changing nurses' knowledge and attitudes which may, in turn, lead to improvement in pain control for patients (Cohen, 1980; Lander, 1990, Watt-Watson, 1987; 1989).

Several studies have examined the effects of inservice education programs on nurses' knowledge and attitudes about pain management. In most cases these studies have been specific to the management of cancer pain. Participants' knowledge and attitudes were tested prior to the program. Following the inservice program, nurses were found to be less concerned about addiction, respiratory depression and sedation. Knowledge about analgesic administration and attitudes towards the patient in pain were found to improve significantly (Degner, Fuji, & Levitt, 1982; Hauck, 1986: Myers, 1985) and to persist over time (Hauck, 1986; Meyers, 1985).

Regardless of change in knowledge or attitude, patterns of analgesic administration were not found to change following a pain inservice program (Donovan & Dillon, 1987). Therefore, while significant changes in nurses' knowledge and attitudes may occur following participation in education programs, the changes may not be reflected in clinical practice.

Investigators have searched for factors which may influence nurses' knowledge and attitudes about pain. Both amount of experience and educational background have been examined. Level of educational preparation and number of years of experience have not been found to be significantly related to nurses' knowledge and attitudes (Hamilton & Edgar, 1992; Myers, 1985; Romyn, 1990; Watt-Watson, 1987).

Surveys of baccalaureate nursing curricula have ascertained that they have minimal content related to pain and pain management (Graffam, 1990; Watt-Watson, 1987). Further, this content is generally unplanned and dispersed throughout the program rather than occurring in planned identifiable segments that may improve learning. The limited attention to the study of pain in nursing curricula is reflected in the findings of Winefield et al., (1990) who reported that only 50% of practitioners indicated that they had been adequately educated in pain control.

Romyn (1990) studied decisions and knowledge about pain management in a convenience sample of Canadian nursing students. She found that decisions regarding the administration of opioid analgesics in the management of pain were not based on accurate knowledge. Romyn's findings reflect those found in other investigations which surveyed samples of practicing nurses (Charap, 1978; Cohen, 1980; Marks & Sachar, 1973; Weis et al., 1983; Watt-Watson, 1987).

It is critical that students be provided with accurate information related to pain management and be exposed to superior clinician models. Romyn's findings raise the question about whether or not educators have met this obligation. It may be that educators are similar to the nurses studied previously, deficient in knowledge about pain management and

therefore unable to inform their students. As yet, the quality of nurse educators' knowledge about use of opioid analgesia management of pain is unknown.

Therefore, the purpose of this study is to describe nurse educators' knowledge and clinical decisions in the area of acute pain management with opioid analgesics. In addition, nurse educators' perceptions regarding pain management content in nursing curricula will be assessed.

The specific research questions addressed in the study include:

1. What information do nurse educators report giving to students about acute pain management with opioid analgesics?
2. What views do nurse educators express about the adequacy of student knowledge and preparation?
3. How knowledgeable are nurse educators about the management of acute pain with opioid analgesics?
4. What decisions do nurse educators make about the management of acute pain with opioid analgesics?
5. Is there a relationship between nurse educators' decisions related to the management of acute pain with opioid analgesics and their knowledge regarding potential drug interactions, risks of addiction and duration action of opioid analgesics?

Method

Sample

Each of the five districts of the Alberta Association of Registered Nurses (AARN) supports at least one nursing education program. The Alberta programs include those offered in colleges and universities as well as those associated with hospitals. The sample consisted of nurse educators who may be teaching in these programs and who are registered with the AARN. To be selected for this study nurse educators must have been registered with the association as Instructor/Professor, teaching in

either a diploma or degree program during 1990-1991. Three hundred and twenty members of the AARN from across Alberta met these criteria. As it was limited in size, the entire population was included in the study.

Although all nurse educators in the province of Alberta are required to be registered in order to practice, it is possible that some may work without being registered. It is also possible that some educators may have several roles and may not classify themselves as educators when they register. In such cases, the educator would either not be listed in the computer file or would not be listed as an educator.

Instruments

Data were collected using a questionnaire developed for the purposes of the study (Appendix B). Some of the items were developed for this study while others were derived from the literature and from studies on related topics (Lander, 1990; Romyn, 1990). Formats for the items included checklists, open-ended and forced-choice questions. The questionnaire was deliberately kept short in order to encourage participation.

The questionnaire included items to assess: (1) the extent to which information about pain and pain management is included in nursing programs; (2) what information about acute pain management with opioid analgesics is relayed to students; (3) nurse educators' knowledge and clinical decisions about the management of acute pain with opioid analgesics and (4) demographic traits of nurse educators. The items that assessed nurse educators' knowledge pertained to potential drug interactions, risks of addiction and duration of action of opioid analgesics. The frequency of administration of opioid analgesics was assessed within the context of vignettes designed to examine decision making. These were adaptations of vignettes developed by Romyn (1990). Test-retest reliability of the instrument was not determined because observed differences in responses could be related to other factors such as learning.

Procedure

This study was formulated as a descriptive design employing a postal survey approach. Although a face-to-face survey usually results in a higher response rate than a mail survey, the latter was chosen for this study for several practical reasons. A postal survey was less costly than face-to-face interviews. This approach would also guarantee anonymity.

The survey was developed and, in order to establish face validity, was reviewed by content experts. Following revisions, the questionnaire was pretested with a group of twelve individuals who had previous experience as nurse educators but who no longer practised in that role. These individuals would not be registered with the AARN as nurse educators and therefore would not be part of the sample. They each completed the survey, providing feedback on item clarity and questionnaire length.

Written permission to access the population was obtained from the Executive Director of the AARN. Using their computerized files, the AARN identified all members listed as teaching in either a diploma or degree program during 1990-1991. There were 230 nurse educators who were employed in diploma programs and 90 educators employed in degree programs. Address labels were printed for each registered nurse educator who met the selection criteria and these were applied to survey packages by AARN staff. This procedure ensured that the researcher had no access to the identity of potential respondents.

Survey packages consisted of a questionnaire, covering letter and self-addressed return envelope (Appendix C). These were mailed in the third week of June 1991. Responses were received for eight weeks. By the end of eight weeks, no further responses were being received and therefore data collection was terminated.

Results

Sample Characteristics

Of the 320 questionnaires which were mailed, five questionnaires were returned unanswered by individuals who indicated that they were no

longer employed in nursing education. Of the remaining 315, 158 were completed and returned. Thus there was a 50% response rate. Response rates varied by AARN district, ranging from 43% to 87.5% (Table 1). Due to the very small numbers of educators in 3 of the 5 districts, analyses were not conducted by district.

Table 2 indicates the breakdown of respondents according to nursing education programs in which they worked. As both hospital and college programs offer nursing diplomas, 114 respondents were teaching in diploma programs. Thus, 49% of the 230 educators in diploma programs responded to this survey. A comparable 48% of educators in university programs also responded to this survey.

Amount of teaching experience was also assessed in this study. About half of the respondents (58.8%, n=93) had less than 11 years of experience in nursing education (Table 3). They were responsible for teaching and supervising students in a variety of areas although the most common was medicine-surgery.

Also assessed was amount of experience with direct patient care (Table 4). Most respondents (78%, n=120) had under 11 years of direct patient care experience. Recency of clinical experience was also determined. Twenty-one percent (n=32) of respondents were currently working as nurses in the clinical setting as well as teaching. Although not current, about a third of the respondents (34%, n=52) reported that their most recent clinical experience was within the last 5 years and about half (45%, n=69) had not practised in the clinical area for more than six years.

Teaching About Pain

One hundred and twenty-one respondents reported teaching about pain and pain management. The 37 respondents who did not teach about pain were directed to complete items related to demographics only. Educators were

Table 1

Distribution of Sample by AARN District

AARN District	Frequency In Sample	Percent in Sample	Total in District	Response Rate
North	7	4.5	8	87.5
North Central	82	52.2	166	49.4
Central	13	8.3	20	65.0
South Central	41	26.1	95	43.0
South	14	8.9	31	45.2
Total	157	100	320	%

Table 2

Distribution of Sample and Population by Program

Type of Program	Sample Frequency	Population	Percent from Population
Hospital	63	230	50
College	51		
University	44	90	50
Total	158	320	100

Table 3

Respondents' Years of Teaching Experience

Nursing Education		
Years	Frequency	Percent
1 - 5	49	31
6 - 10	44	28
11 - 15	31	20
over 15	34	21
Total	158	100

Table 4

Respondents' Years Providing Direct Patient Care

Provision of Direct Patient Care		
Years	Frequency	Percent
1 - 5	56	36
6 - 10	64	42
over 10	34	22
Total	154	100

asked about the amount of time they dedicated to teaching the subject in the classroom. Approximately one third reported teaching about pain and pain management in the classroom between 1-3 hours over the last year (Table 5: 34%, n=41). Thirty-eight percent did not answer the question (n=46).

Respondents were also asked to report amount of time given to teaching about pain in the clinical area. About half of the respondents (n=57, 47%) spent 1-5 hours over the last year discussing the topic in the clinical area and 17% (n=21) discussed it for more than five hours (Table 6). A small number did not know how much time they spent teaching about pain and pain management in either the classroom or clinical area. Other respondents made general comments such as "ongoing or continuous."

Educators' areas of teaching were cross tabulated with whether they did or did not teach about pain. The number who taught about pain varied by the clinical area (Table 7). Small cell sizes in the contingency table made inferential analyses inappropriate.

Respondents who taught about pain were asked to report their discussions with students. The categories were not mutually exclusive as respondents were requested to check all descriptors that applied to their particular situations. Their responses were ranked. Teacher-initiated informal discussion was the most frequently identified method (n=103). Threading the content through several courses was ranked second (n=73) and teaching pain as part of a separate course ranked third (n=22).

When all respondents were asked whether or not the amount of pain content in their curricula should be altered, 68% (n=97) of the respondents would choose to increase the amount of content related to pain

Table 5

Classroom Teaching about Pain and Pain Management

Hours	Frequency	Percent
None	12	10
1 - 3	41	33
4 - 6	10	8
7 - 10	6	5
Over 10	2	2
Comment only	2	2
Don't know	2	2
Missing	46	38
Total	121	100

Table 6

Clinical Teaching about Pain and Pain Management

Hours	Frequency	Percent
None	1	1
1 - 5	57	47
6 - 10	11	9
11 - 15	3	2
16 - 20	3	2
Over 20	4	4
Comment only	23	19
Don't know	2	2
Missing	17	14
Total	121	100

Table 7

Frequencies of Those Who Teach/Don't Teach about Pain by Clinical Area

	Yes	No	Total
Clinical Area	Frequency	Frequency	
Med/Surg	68 (89)*	8 (11)	76
Obstetrics	12 (92)	1 (8)	13
Psychiatry	5 (50)	5 (50)	10
Pediatrics	13 (100)	0 (0)	13
Geriatrics	1 (50)	1 (50)	2
Community	0 (0)	9 (100)	9
Several areas	18 (82)	4 (18)	22
Missing	4	9	13
Total	121	37	158

*=percent of row total in brackets

and pain management while 27% would maintain the current amount of content. Four percent of the educators suggested maintaining the current amount of content but changing the emphasis and approach to teaching as well as increasing the degree of assistance in clinical application.

Pain Management Decisions

Two case studies were included to examine decisions nurse educators would make regarding administration of narcotic analgesics to post-operative patients in acute pain. The first case study presented a post-operative patient who had an order for Demerol 75-125 mg every 3-4 hours. The patient, being cared for by a student, was described as experiencing continuous severe pain that was unrelieved by a dose of 75 mg of Demerol that had been administered three hours previously. Respondents were asked if the student should administer Demerol at this time. A response of "yes" was considered to be correct. Forty-eight percent chose a correct response. Respondents were then asked how much Demerol the student should give. The correct response was considered to be 125 mg. Forty-seven percent chose the correct response (Table 8). Incorrect responses included the three percent who would administer the same dose despite an order permitting an increased dose and a further forty-three percent (n=51) who would administer 100 mg of Demerol 3 hours following the 75 mg dose. A small number (6%) of educators provided a range of dosages they would give rather than a specific dose. These respondents were also considered to be incorrect.

Table 8

Educator Decisions for Vignette 1: Dosages of Analgesic

	Frequency	Percent
Dose #1		
75 mg	4	3
100 mg	51	42
113 mg*	7	6
125 mg	57	47
Missing	2	2
Dose #2		
25 mg	5	4
50 mg	1	1
100 mg	8	6
113 mg*	3	3
125 mg	88	73
Missing	16	13

n=121

*=Mean of 113 was assigned to respondents who gave a dosage range of 100 - 125

The patient in the case study was described as continuing to experience pain. Respondents were asked to indicate when the student should administer the next dose of Demerol and how much should be administered. The correct time interval between doses was considered to be 3 hours (Table 9) and the correct amount of Demerol was 125 mg (Table 8). If the pain continued unrelieved, 84% (n=88) would administer 125 mg of Demerol following another three hour interval. A maximum of 8 doses of Demerol could be administered in a 24 hour period to the patient in this case study and 86.6% of the respondents said they would administer the maximum number (Table 10).

Several respondents wrote notes requesting information about age, weight, and sex of the patient described in the first vignette. Other educators indicated that they would contact a physician for a new analgesic order when the patient's pain was not controlled. Some would call the physician following the initial 75 mg dose, others shortly following the 100 mg dose. One respondent correctly indicated that the analgesic order needed to reflect the duration of action of Demerol which the educator subsequently identified as 2-3 hours.

In a second case study, educators were asked whether a patient should receive morphine at regular intervals or on a PRN basis during the first post-operative day following major orthopedic surgery. Many educators 64% (n=75) correctly indicated that the patient should receive analgesics at regular intervals whereas others (35%) incorrectly chose to administer analgesics on a PRN basis. When asked to select from a list of options the one which accurately reflected the duration of action of

Table 9

Interval between Dose #1 and Dose #2

Interval	Frequency	Percent
15 min	1	1
30 min	3	3
1 hr	3	3
2 hr	2	2
3 hr	96	90
4 hr	1	1
Missing	15	12

n=121

Table 10

Number of Doses in 24 Hours

Total Doses	Frequency	Percent
6	7	6
7	4	3
8	97	80
9	3	3
12	1	1
Missing	9	7

n=121

morphine, 70% (n=81) of the educators correctly chose every 3-4 hours while 22% incorrectly chose every 2-3 hours.

Subjects were assigned a score (1=correct and 0=incorrect) for each of the five decision items from the two vignettes. Missing responses or responses that indicated that the educator did not know the answer were scored as incorrect. When scores for the five decision items were totalled, 40% correctly answered all five decision items (Table 11).

Decision scores were analyzed in terms of respondents' site of employment, years of teaching, years of clinical experience, and recency of clinical experience. There were no significant differences in total decision scores for any of these variables following analysis with the Kruskal-Wallis test.

Educator Knowledge Related to Opioid Analgesics

Nurse educators were asked three direct questions to assess knowledge of opioid analgesics. The first question related to the risk of addiction associated with the administration of opioid analgesics:

Item 1

"A patient is given Demerol 100 mg every 4 hours for 10 days. A student wants to know what the risk is of this patient becoming addicted to Demerol. Circle the answer which best represents your response. (1=little possibility of becoming addicted; 7=great possibility of becoming addicted)"

1 2 3 4 5 6 7

Little Great

Possibility Possibility

The correct response for the item was considered to be 1 (very unlikely to become addicted). Those who chose 2 were given the benefit of doubt and

Table 11

Distribution of Total Scores for Decisions Items 7 - 11

Correct responses	Frequency	Percent
0	2	2
1	9	7
2	14	12
3	13	11
4	34	28
5	49	40
Total	121	100

scored as correct. Table 12 summarizes the results. The mean score was 2.5 (std.dev.=1.7). Most nurse educators (59%, n=71) correctly stated that there was little possibility of the patient becoming addicted. Several educators wrote comments in the margins stating that patients with "real" pain will not become addicted. Others stated that whether or not a patient becomes addicted depends on the medical diagnosis.

The second question asked about the interaction of Phenergan and opioid analgesics.

Item 2

"A student is caring for a postoperative patient who continues to experience pain despite being given narcotic analgesics. The patient also has an order for Phenergan. The student wants to know whether or not Phenergan will potentiate the analgesic effect of the narcotic. (1=little possibility of potentiation of analgesic effect; 7=great possibility of potentiation of analgesic effect)"

1	2	3	4	5	6	7
Little Possibility						Great Possibility

The correct response for the second item was 1 (little possibility). Again, those who chose 2 were given the benefit of the doubt and scored as correct. Table 13 summarizes the results. The mean score was 4.8 (std.dev.=2.2). There were 27 respondents (22%) who correctly stated that there was little possibility of Phenergan potentiating the analgesic effect of the narcotic. One written comment correctly identified that Phenergan would increase the sedative effect of the narcotic but would not potentiate the analgesic effect.

A third question required respondents to determine which group(s) of students required remedial instruction regarding the duration of action of

Table 12

Frequency of Responses Related to Risk of Addiction

	Options						
	1*	2*	3	4	5	6	7
Frequency	46	25	19	8	8	7	2

n=121

Missing=6

*=correct answer

Table 13

Frequency of Responses Related to Phenergan-Narcotic

	Options						
	1*	2*	3	4	5	6	7
Frequency	21	6	2	5	22	32	29

n=121

Missing=4

*=correct answer

Demerol:

Item 3

"The range of analgesic effect means the duration of time that an analgesic provides relief. In a recent survey, students were asked to identify the range of analgesic effect of Demerol. Students could be placed in 1 of 3 groups on the basis of their response.

Group A: About 1/3 said 2-3 hours
Group B: About 1/3 said 3-4 hours
Group C: About 1/3 said 4-6 hours

Those who selected both Groups B and C were considered to be correct. Most respondents (85%, n=103) were unable to identify the correct response (Table 14).

Subjects were assigned a score (1=correct and 0=incorrect) for each of the three knowledge questions. Missing responses or responses that indicated that the educator did not know the answer were scored as incorrect. When scores for the three knowledge questions were totalled, 5% (n=6) of the educators correctly answered all three questions while 34% incorrectly answered all three questions (Table 15).

Using the Kruskal-Wallis test, categorical data for site of employment of the respondents, years of experience teaching, years of experience providing direct patient care and recency of that experience were assessed for total knowledge scores. There were no significant differences in total knowledge scores for educational program, teaching experience and recency of clinical experience. Only clinical experience was significant (Kruskal-Wallis; Chi-square=7.75, df=3, $p<0.05$). Those educators who had provided more than 15 years of direct patient care achieved higher scores on the three knowledge items than those educators who had fewer than 15 years of clinical experience.

Table 14

Duration of Action of Demerol: Correct and Incorrect Responses

Correct		Incorrect	
Frequency	Percent	Frequency	Percent
18	15	103	85

n=121

Missing=1

Table 15

Distribution of Total Scores for Knowledge Items 1 - 3

Correct responses	Frequency	Percent
0	41	34
1	50	41
2	24	20
3	6	5
Total	121	100

The correlation between knowledge scores and decision scores was low and not significant (Spearman= -0.11). Educators were asked to indicate on a seven point scale (1=not very knowledgeable; 7=very knowledgeable) how knowledgable they felt about pain and pain management. Mean perceived knowledge about pain and pain management was 4.6 (std. dev.=1.3). The correlation between perceived knowledge and knowledge scores was near zero and non-significant (Spearman=0.01). Similarly the correlation between perceived knowledge and decision scores was also near zero and non-significant (Spearman=-0.035).

Educator Perception of Student Knowledge

Educators were asked several questions about student knowledge. These items were included with the intention of assessing educator knowledge indirectly by asking how their students would respond. One of these questions concerned the interaction of MAO inhibitors and Demerol:

Item 4

"Consider that Demerol has been ordered for a patient who is taking an MAO inhibitor drug such as phenelzine (Nardil). What would the average student say is the possibility of a toxic reaction? (1=little possibility of toxic reaction; 7=great possibility of toxic reaction)

1	2	3	4	5	6	7
Little Possibility						Great Possibility

The correct response was considered to be 7 (great possibility). Those who chose 6 were given the benefit of doubt and scored as correct. About one third of respondents (31%, n=37) stated that they thought students would report a great possibility of a toxic reaction occurring if Demerol was administered with an MAO inhibitor.

A second question about student knowledge related to the interaction of Elavil and narcotic analgesics:

Item 5

"Consider that Elavil (a tricyclic antidepressant) has been ordered for a patient in pain who is also anxious. What would the average student say is the possibility that Elavil will decrease the amount of narcotic analgesic required? (1=little possibility that analgesic requirements will decrease; 7=great possibility that analgesic requirements will decrease)

1 2 3 4 5 6 7

Little Possibility — Great Possibility

The correct response was considered to be 7 (great possibility). Again, those who chose 6 were given the benefit of doubt and scored as correct. A number of respondents (21%, n=25) thought students would report a great possibility that a decreased amount of narcotic analgesic would be required if Elavil was administered along with the narcotic.

Finally, respondents were asked about student knowledge related to the interaction of Gravol and narcotic analgesics:

Item 6

"A hospitalized patient becomes nauseated following each dose of morphine. Dimenhydrinate (Gravol) is ordered to decrease nausea. What would the average student say is the possibility that simultaneous administration of Gravol and morphine will decrease the amount of morphine required? (1=little possibility that analgesic requirements will decrease; 7=great possibility that analgesic requirements will decrease)

1 2 3 4 5 6 7

Little Possibility — Great Possibility

The correct response was considered to be 1 (little possibility). Respondents who chose 2 were given the benefit of the doubt and scored as

correct. Many respondents (42%, n=51) stated students would know that Gravol does not potentiate Demerol.

The responses which were generated by respondents on Items 4-6 reflected what educators believed students would say. They will be referred to as generated scores.

Educators were also asked to indicate whether or not they thought the responses they had generated on behalf of the 'average student' were correct or incorrect. They provided this information for each of the above three items (Items 4-6). Their responses, which included correct, incorrect and don't know will be referred to as assessment scores. The generated scores were crosstabulated with assessment scores for each of items 4 to 6 (Table 16). The contingency tables were examined to determine how knowledgeable nurse educators were about pain management when asked to respond to questions through imaginary students. This method was chosen rather than a direct assessment of their knowledge in order to prevent the survey appearing as a test.

Each contingency table produced four cells. Meaningful information could be obtained from cells 'a','b' and 'c' about educator knowledge. Cell 'a' indicated that the educator possessed the knowledge to be able to identify a student response as correct. Cell 'b' indicated that the educator did not have the knowledge to be able to identify a correct student response while 'c' cells indicated that the educator did not possess the knowledge to be able to identify an incorrect student response. The information obtained from 'd' cells was ambiguous in that the educator's response could be based on either knowing that students would be unlikely to know the answer or on personal uncertainty about how

Table 16
Educator Prediction of Student Response and Assessment about Accuracy of Student Response

		Educators' Assessment about Accuracy of Student Response					
		Item 4		Item 5		Item 6	
		Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Generated Student Response	Correct	33 (27%)[a]	4 (3%)[b]	20 (17%)	5 (4%)	46 (38%)	5 (4%)
	Incorrect	31 (26%)[c]	37 (31%)[d]	53 (44%)	32 (26%)	41 (34%)	25 (21%)
	DK	16 (13%)		11 (9%)		4 (3%)	

a=Correct

b and c=Incorrect

d=Ambiguous

DK=Don't Know

the students might answer. In summary, cell 'a' indicates correct knowledge; cells 'b' and 'c' indicate incorrect knowledge and cell 'd' is ambiguous.

With data regrouped into these three categories (correct, incorrect and ambiguous), pair-wise comparisons were made for items 4, 5 and 6 (Tables 17-19) with Chi-square analyses. These analyses were performed in order to assess any trends in responses. There were no significant findings.

Total knowledge scores for items 1 to 3 (use of opioids) were grouped into high and low scores by median split. Then correct, incorrect and ambiguous response groups were compared for high and low knowledge scores. This was done separately for items 4 to 6. Tables 20-22 summarize the results. High and low total knowledge scores did not differ for categories of responses to items 4 or 5. However, there was a significant difference for item 6. Those who answered item 6 correctly were more likely to be in the high total knowledge score group rather than in the incorrect or ambiguous group (Table 22: Chi square=13.0, df=2, $p<0.001$).

Educators were asked what students could achieve on a 10 item exam of basic working knowledge of pain management. The mean score was 6.33 (std.dev.=1.35). Site of employment of the respondents was compared for predicted student scores on such an exam and there were no significant differences across programs (Kruskal-Wallis test used).

When asked to indicate on a seven point scale (1=poorly prepared; 7=well prepared) how well prepared their students were to manage patients' pain, nurse educators gave a mean response of 4.55 (std.dev.=1.28). There were no significant differences across programs in educators' perception of how well prepared students were to manage patients' pain (Kruskal-Wallis test used).

Table 17

Crosstabulation: Item 4 Responses by Item 5 Responses

		Item 5			
		Correct	Incorrect	Ambiguous	Total
Item 4	Correct	9 (7%)*	21 (17%)	3 (2%)	37 (31%)
	Incorrect	9 (7%)	30 (25%)	12 (10%)	51 (42%)
	Ambiguous	2 (2%)	18 (15%)	17 (14%)	33 (27%)
	Total	20 (17%)	69 (57%)	32 (26%)	121 (100%)

*=percent of sample in brackets

Table 18

Crosstabulation: Item 4 Responses by Item 6 Responses

		Item 6			
		Correct	Incorrect	Ambiguous	Total
Item 4	Correct	14 (12%)*	14 (12%)	5 (4%)	33 (27%)
	Incorrect	17 (14%)	26 (21%)	8 (7%)	51 (42%)
	Ambiguous	15 (12%)	10 (8%)	12 (10%)	37 (31%)
	Total	46 (38%)	50 (41%)	25 (21%)	121 (100%)

*=percent of sample in brackets

Table 19

Crosstabulation: Item 5 Responses by Item 6 Responses

		Item 6			
		Correct	Incorrect	Ambiguous	Total
Item 5	Correct	8 (7%)*	7 (6%)	5 (4%)	20 (17%)
	Incorrect	30 (25%)	28 (23%)	11 (9%)	69 (57%)
	Ambiguous	8 (7%)	15 (12%)	9 (7%)	32 (26%)
	Total	46 (38%)	50 (41%)	25 (21%)	121 (100%)

*=percent of sample in brackets

Table 20

Item 4 Responses by Total Scores of Items 1 - 3

	Item 4			
	Correct	Incorrect	Ambiguous	Total
At or Above the Median	22[a]	32	26	80
	22[b]	19	24	
Below the Median	11	19	11	41
	4	17	13	
Total	33	51	37	121

a=Observed frequency

b=Expected frequency

Table 21

Item 5 Responses by Total Scores of Items 1 - 3

	Item 5			
	Correct	Incorrect	Ambiguous	Total
At or Above the Median	14[a]	51	15	80
	13[b]	46	21	
Below the Median	6	18	17	41
	7	23	11	
Total	20	69	32	121

a=Observed frequency

b=Expected frequency

Table 22

Item 6 Responses by Total Scores of Items 1 - 3

	Item 6			
	Correct	Incorrect	Ambiguous	Total
At or Above the Median	35[a]	24	21	80
	30[b]	33	17	
Below the Median	11	26	4	41
	16	17	8	
Total	46	50	25	121

Chi square=13, df=2, p<0.003*

a=Observed frequency

b=Expected frequency

*=Significant at p<0.003

Discussion

Educators Knowledge and Decisions

The findings of this study suggest that respondents lack fundamental knowledge about the pharmacological management of acute pain with opioid analgesics. This notion was supported by the educators who assessed their own knowledge to be low. It had been anticipated that respondents should be sufficiently knowledgeable to respond to most items in the survey and would rate themselves as very knowledgable about pain management. The justification for these presumptions was that survey items addressed basic pharmacological knowledge, that all respondents taught about pain within the last year, that many respondents supervised students in clinical areas and that more than half had been involved in direct patient care in the last five years. Regardless, overall knowledge and decision scores were low and these findings are consistent with those of other studies (Cohen, 1980; Ketovuori, 1987; Romyn, 1990; Watt-Watson, 1987).

There were a number of pain management topics about which the educators were not informed. Despite evidence to the contrary, many nurse educators stated that there is a risk of addiction for patients during the post-operative period. Educators' clinical practice and supervision of students could be influenced by this belief. They could, for example, control the amount of opioid analgesics patients receive.

The majority of respondents were not informed about doses and properties of analgesics. While research indicates that Phenergan potentiates the sedative effect of narcotic analgesics (Weis et al, 1983) it does not support the notion that it potentiates the analgesic effect (Keats, Telford & Kurosu, 1974; McGee & Alexander, 1979). Nurse educators were not knowledgeable about either of these points. Similar lack of knowledge was observed for Gravol. It could be that educators were not

differentiating between analgesic and sedative effects. Nonetheless, this lack of differentiation would be considered a deficiency in basic knowledge.

Large numbers of respondents also were not aware of the potential for toxic interactions between drugs such as MAO inhibitors and Demerol and the potential for beneficial interactions between drugs such as tricyclic antidepressants and opioid analgesics.

In spite of poor basic knowledge, some clinical decisions educators would make about pain management were appropriate. For example, many were accurate with respect to the intervals between doses of analgesics and total number of doses in a 24 hour period. These findings are contrary to those reported in recent studies of staff nurses and students. It could be that these particular decisions were based on sound knowledge. If this were the case then in time one would expect students and staff nurses to make similar decisions assuming educators' knowledge will be transferred. Another accurate clinical decision made by many educators pertained to administration of analgesics at regular intervals rather than on a PRN basis. Similar results were obtained with student nurses (Romyn, 1990). Regardless, opioid analgesics are not frequently administered on a routine basis in clinical practice.

Despite the optimistic findings about clinical decisions, there were a number of discouraging ones. There were many educators who would administer analgesics on a PRN basis despite evidence that this practice compels patients to experience cycles of severe pain. Nurse educators generally favored gradual increases in analgesic dosages so that a minimum effective dose could be found. This strategy would result in a delay in achieving effective analgesia and unnecessary prolongation of the pain experience. Initial administration of a high dose of opioid analgesic

followed by a gradual decrease to a balanced dose are good pain management practices (Twycross, 1984).

The small number of educators who would continue to administer the same ineffective dose of analgesic is of grave concern as this suggests a willingness to allow the patient to suffer needlessly. Romyn (1990) reported that some student nurses would make the same choice in response to a similar vignette.

Finally, the use of a dosage range (for example, 100-125 mg) in response to questions seeking a specific dose indicates a lack of confidence in making decisions. Romyn (1990) observed the same with student nurses in her survey.

It was predicted that there would be a positive relationship between the knowledge scores of nurse educators and the decisions that they would make in the clinical area. However, the nurse educators in this study did not base decisions on accurate knowledge. It could be that decisions were based on what is commonly done in the clinical area rather than on sound theory. If this is the case then it is quite likely that acute post-operative pain is not consistently well managed in clinical settings. Moreover, if nurse educators are not making decisions based on sound theory, then it is likely that there is no expert in the clinical area for students to consult.

Educational Matters

The results of this study suggest a reason for Romyn's findings in relation to student nurses. It follows that if nurse educators lack fundamental knowledge about pharmacological management of pain with opioid analgesics, it is likely that their students will demonstrate a similar or greater lack of knowledge. One would expect that such a lack of

understanding about pain would be reflected in a lack of curricular emphasis on the topic of pain.

Nurse educators spend very little time on content related to pain and pain management in either classroom or clinical settings. These findings support those of Graffam (1990) and Watt-Watson (1989). Content is generally addressed in a spontaneous fashion rather than planned and discussed in a formalized way. This could account for the large number of educators who reported teaching about pain and pain management but who could not indicate how much time they actually spent teaching about the topic. Although many educators stated that the pain and pain management content in nursing curricula should be increased, there were those who believed the amount was adequate. A few others recommended changes in the method by which content is taught. One example of a change in method is presentation of the content in a block rather than threading it through the curriculum.

Although the majority of educators who supervised students in medical/surgical areas reported teaching about pain and pain management, it is of concern that none of those supervising students in community health reported doing so. It could be that the focus in community health is the newborn and mother, however, one would anticipate that students would have some contact with individuals for whom pain is an issue. A similar concern exists about educators teaching in obstetrics and geriatrics.

There were numerous comments written on the questionnaires indicating concern about the topic of pain and pain management among nurse educators. This perhaps indicates that changes may occur in nursing education in the future.

A Comparison of Students and Educators

When the findings of this study were compared with those of a similar study involving student nurses (Romyn, 1990), educators generally overestimated the knowledge level of the average student. It was the perception of educators in this study that students could achieve an average mark of 63% on a ten item examination on basic working knowledge of pain and pain management. Romyn (1990) found that students actually achieved an average mark of 35% when asked 12 questions similar to those asked of nurse educators in this study. Educators generally felt that students were less than well prepared to manage pain in the clinical setting when they graduated.

There were no significant differences across programs in the observed lack of knowledge among educators related to the management of acute pain with opioid analgesics. This finding supports that of Romyn (1990) who reported finding no significant differences in nursing students' knowledge level across nursing programs.

However, the findings that educators were generally accurate in decisions about intervals between doses and total number of doses are not consistent with Romyn's (1990). She reported that students would choose a longer interval when given a choice and this result has also typically been observed in studies about practising nurses.

Comments on Procedure and Instrumentation

Several questions can be raised about the methods of the present study. It was assumed that respondents would answer questions related to the vignettes in a manner which would reveal actual clinical decisions. Respondents, however, do not have the opportunity to verify clues or seek additional data when vignettes are employed. This is quite unlike the conditions afforded by the clinical area. Therefore, written responses and

reports about what educators would say or do cannot be used to predict actual content taught or decisions that would be made in clinical practice.

The use of a postal survey does allow the educator to utilize other available resources. If respondents did avail themselves of resource material however, then the lack of knowledge may be more extensive than the findings of this study suggest. Many respondents wrote notes in the margins seeking additional information such as patient's age or weight. In most cases the additional information was not required for pain management and served to confirm a lack of knowledge among nurse educators.

It could also be argued that it was those educators who felt most knowledgeable who chose to respond. If this were the case, then the findings of this study would overestimate knowledge and clinical decision abilities of nursing educators in this province.

While the population of Alberta nurse educators was surveyed, 50% responded. The response rate of nurses was typical of that observed in several other studies that have been done in the province. It, therefore, seems as though there may be a certain number of nurses who tend not to respond to surveys. There were disproportionate numbers who responded from some districts and this has been found in the past (Ramsay, 1983). There also was proportionate representation from both diploma and degree nursing education programs. There was thus no clear indication of how the sample might be biased. Had other data been collected about respondent characteristics, it might have been possible to determine if a sampling or response bias was present. Questions which might identify respondents were kept to a minimum in order to encourage participation.

The manner in which Items four, five and six were phrased generated some ambiguous data and consequently did not allow a clear measure of knowledge. It is recommended that these questions be phrased to elicit information in a more direct manner or not be used. It would, of course be

preferable to have respondents tested under more stringent conditions. This, however, could not be done in the present study if anonymity was to be maintained.

Summary

In summary, several notable findings were obtained as a result of this study. It was observed that: (1) educators' knowledge about pain is inadequate but many are cognizant of this deficiency; (2) educators do make some appropriate clinical decisions about pain management however, their decisions are not based on accurate knowledge; (3) educators spend very little time emphasizing content related to pain management but many are cognizant of this deficiency and (4) educators feel that students are not well prepared to manage pain in the clinical setting when they graduate but none the less, overestimate student knowledge. General comments written on the questionnaires indicate concern about the topic of pain management among nurse educators. This could indicate that changes will occur in nursing education in the future.

Implications

Nursing Education

If nurse educators lack knowledge about pain management, then they are unlikely to be able to provide students with information and guidance so that they can effectively manage pain. Moreover, educators may transmit false information to students. Common myths and misconceptions about pain may be perpetuated by educators. The outcome of such an incomplete education is the creation of generations of nurses who manage pain poorly. There have been a series of studies conducted in this province pertaining to nurses' knowledge and attitudes about pain. A number of other studies have been conducted about prevalence of patient pain or pain management strategies. Each one indicates a problem related to nurses' knowledge about pain and the necessity for improved pain management. More than ever before, nurses and physicians are cognizant of the deficiencies in their

clinical practice. This, therefore, is the time for educators to direct attention toward improvement of clinical practice.

Educators can be encouraged to learn and transmit findings arising from clinical pain research. The resources are abundant; at least four major journals are devoted to research on the topic of pain and pain management. Practicing nurses and students in basic programs will require assistance from educators. Inservice education can be offered to nurses who have graduated and are currently practicing. In this regard, innovative educational strategies must be identified so that the firmly entrenched myths that have been documented can be broken down.

Changes will be required to basic nursing programs. Curriculum committees need to identify essential content based on a review of the literature and consultation with experts in pain management. They need to outline a plan to include content throughout the curriculum in formal classes and clinical conferences. The importance of providing students with accurate information during their basic education is reinforced by findings that improved knowledge and ability to make accurate decisions do not improve with clinical experience.

New and better informed nursing graduates will have to deal with practicing nurses who advocate older and ineffective methods of managing pain. This will be a test for new graduates who may not wish to challenge staff in their work setting less it lead to being shunned. Students will, therefore, have to be provided with strategies to contend with potential conflict with established nurses.

Respondents of this survey frequently wrote notes acknowledging a need for an improvement. Clearly, the time is right for changes to be made to nursing education and practice.

Nursing Research

The findings of this study suggest a number of other studies which could be initiated. It would be important to examine the processes by which educators ensure that their information bases are accurate and

current. Interventions which improve knowledge and decrease faulty judgement about pain management also need to be developed and evaluated. Consequently it would be important to carry out surveys similar to the current one on a periodic basis.

In addition it would be essential to determine what curricular changes would be most beneficial. After the changes have been implemented it would be necessary to evaluate their effectiveness by following the students to see how they perform on surveys similar to this one. It would also be essential to follow students into the clinical area in order to evaluate whether or not they change their views about pain management based on the patients that they see.

Finally, strategies to help practicing nurses learn about pain management need to be developed. This process might be initiated by surveying practicing nurses on their current knowledge level about the topic of pain and pain management. Inservice programs could be planned based on the results of the survey information. Follow-up surveys would need to be administered to evaluate the effectiveness of the programs. The ultimate measure of educational success would be patient reports of less uncontrolled pain.

References

Benedetti, C. & Butler, S. (1990). Systemic analgesics. In J. J. Bonica (Ed.). The management of pain (pp 1637-1699). Philadelphia: Leanfebinger.

Butler,S. (1986). Analgesics and narcotic antagonists. In A. M. Pagliaro & L.A. Pagliaro (Eds.). Pharmacologic aspects of nursing (pp 299-323). Toronto: Mosby.

Charap, A.D. (1978). The knowledge, attitudes, and experience of medical personnel treating pain in the terminally ill. Mount Sinai Journal of Medicine, 45, 561-580.

Cohen, F.L. (1980). Postsurgical pain relief: Patients' status and nurses' medication choices. Pain, 9, 265-274.

Degner, K.F., Fuji, S.H., & Levitt, M. (1982). Implementing a program to control chronic pain of malignant disease for patients in an extended care facility. Cancer Nursing, 5, 263-268.

Donovan, M.I., & Dillon, P. (1987). Incidence and characteristics of pain in a sample of hospitalized cancer patients. Cancer Nursing, 10(2), 85-92.

Fox, L.S. (1982). Pain management in the terminally ill cancer patient: An investigation of nurses' attitudes, knowledge, and clinical practice. Military Medicine, 147, 455-460.

Graffam, S. (1990). Pain content in the curriculum-A survey. Nurse Educator, 15, (1), 20-23.

Grossman S., & Scheidler, V. (1985). Skills of medical students and house officers in prescribing narcotic medications. Journal of Medical Education, 60, 552-557.

Hamilton,J., & Edgar, L. (1992). A survey examining nurses' knowledge of pain control. Journal of Pain and Symptom Management, 7, 18-26.

Hauck, S. (1986). Pain: Problem for the person with cancer. Cancer Nursing, 9(2), 66-76.

Jaffe, J. & Martin, W. (1975). Narcotic analgesics and antagonists. In L.S. Goodman & A. Gilman (Eds.). The Pharmacological Basis of Therapeutics (pp 245-267). Toronto: Macmillan.

Keats, S.; Telford, J. & Kurosu, Y. (1961). Potentiation of meperidine by promethazine. Anesthesiology, 22, 34-41.

Ketovuori, H. (1987). Nurses' and patients' conceptions of wound pain and the administration of analgesics. Journal of Pain and Symptom Management, 2(4), 213-218.

Lander, J. (1990). Fallacies and phobias about addiction and pain. British Journal of Addiction, 85, 803-809.

Liebeskind, J., & Melzack, R. (1987). The International Pain Foundation: Meeting a need for education in pain management. Pain, 30, 1-2.

Marks, R.M., & Sachar, E.J. (1973). Undertreatment of medical inpatients with narcotic analgesics. Annals of Internal Medicine, 78, 173-181.

McGee, J. & Alexander, M. (1979). Phenothiazine analgesia - fact or fantasy. American Journal of Hospital Pharmacy, 36, 633-640.

Moore, J. & Dundee, J. (1961). Alterations in response to somatic pain associated with anaesthesia - the effect of promethazine. British Journal of Anaesthesiology, 33, 3-8.

Myers, J.S. (1985). Cancer pain: Assessment of nurses' knowledge and attitudes. Oncology Nursing Forum, 12(4), 62-66.

Porter, J., & Jick, H. (1980). Addiction rare in patients treated with narcotics. New England Journal of Medicine, 302, 123.

Ramsay, J. (1983). A survey of nurses in Alberta about the structure of the Alberta Association of Registered Nurses. Unpublished report. Alberta Association of Registered Nurses. Edmonton, AB.

Romyn, D. (1990). Nursing students' knowledge and decisions related to the management of cancer pain with narcotic analgesics. Unpublished master's thesis, University of Alberta, Edmonton, Alberta.

Spiegel, K., Kalb, R. & Paternak, G. (1983). Analgesic activity of tricyclic antidepressants. Annals of Neurology, 13, 462-465.

Stauffer, J. (1987). Antidepressants and chronic pain. Journal of Family Practice, 25, 167-170.

Sriwatanakui, K., Weis, O.F., Alloza, J.L., Kelvie, W., Weintraub, M.,& Lasagna, L. (1983) Analysis of narcotic analgesic usage in the treatment of postoperative pain. Journal of the American Medical Association, 250(7), 926-929.

Twycross, R.G. (1984). Narcotics. In Melzack R. & Wall, P. (Eds.) Textbook of Pain (pp. 514-525). New York: Churchill-Livingston.

Watt-Watson, J.H. (1987). Nurses' knowledge of pain issues: A survey.Journal of Pain and Symptom Management, 2, 207-211.

Watt-Watson, J. (1989). Pain curriculum. Canadian Nurse, 85,(9), 44.

Weis, O.F., Sriwatanakui, K., Alloza, J.L., Weintraub, M., & Lasagna, L. (1983). Attitudes of patients, housestaff and nurses toward postoperative analgesic care. Anesthesia and Analgesia, 62, 70-74.

Winefield, H.R., Katsikitis, M., Hart, L.M., & Rounsefell, B.F. (1990) Postoperative pain experiences: relevant patient and staff attitudes. Journal of Psychosomatic Research, 34(5), 543-552.

Appendix A

Post-operative Pain:

A Review of the Literature

by

Bev Williams

Inadequate pain management is a common problem for those who have undergone surgery. Up to 75% of hospitalized patients continue to suffer moderate to severe pain despite treatment with opioid analgesia (Cohen, 1980). Uncontrolled post-operative pain may interfere with many activities helpful to early recovery. The purpose of this paper is to present an overview of the theory of pain, factors which influence pain, etiology and incidence of post-operative pain and factors which influence the management of post-operative pain.

Definition of Pain

Pain is such a subjective experience that a satisfactory definition has remained elusive. Although many definitions of pain can be found in the literature (Sternbach, 1968; Melzack & Casey, 1968; Mersky & Spear, 1986) no one definition is completely accurate. Recognizing pain as a complex phenomenon, the International Association for the Study of Pain (IASP) developed the following definition: "pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" (IASP, 1979). This definition encompasses pain of physiological and psychologic origins and also accounts for the sensory, affective and motivational aspects of the experiences.

However Melzack and Wall (1988) have stated that an accurate definition of pain cannot be formulated. They view the word pain as representing a category of experiences that are unique, have different causes and are characterized by various sensory and affective dimensions. The common element included in many of the definitions and the crucial

point to remember when attempting to deal with pain is the highly subjective and unique nature of the experience.

Theory of Pain

The current and most widely recognized theory of pain is the Gate Control theory (Melzack & Wall,1988). According to the theory, specific or nonspecific nociceptive information is transmitted by small myelinated A-delta fibres and large diameter unmyelinated C fibres to the substansia gelatinosa which is located in the dorsal root of the spinal cord. The cells of the substansia gelatinosa function as a gate control system that modulates the afferent patterns thereby influencing the activity of cells that project to the brain. If large diameter fibres are active the amount of transmitter substance released is decreased, the gate is closed and pain perception is inhibited. On the other hand, if stimulation is greater along small diameter fibres, there is inhibition of interneurons of the substansia gelatinosa, the gate opens and pain is perceived. The theory further postulates that the afferent patterns of stimulation in the dorsal column system serve as a central control trigger to activate selective brain processes. These central processes have the capability of modulating the gate control system. The descending influences activated in the brain stem form a feedback loop within the dorsal root substansia gelatinosa of the spinal cord to prevent additional pain impulses from ascending to the cerebral cortex. When the nociceptive input is massive, as in severe pain, the gate can be reopened, changing the perception of pain. The cerebral cortex may also alter the perception of pain through excitation or inhibition of information which has been transmitted to the brain.

There have been a number of modifications to the original Gate Control theory. Selection and modulation of incoming pain sensations in the neospinothalmic projection system were considered to be the mechanism for the sensory-discriminative component of pain. Reticular formation and limbic system were thought to be responsible for the aversive drive and

affective reactions to pain (motivational-affective component of pain). Finally, higher central nervous system functions were thought to be involved in the pain experience and response. These were primarily cognitive functions that acted selectively on sensory processes and/or motivational mechanisms. Thus the pain experience was believed to encompass sensory-discriminant, motivational-affective and cognitive components.

Factors influencing pain

Pain threshold and pain tolerance

Two concepts related to the subjectivity of the pain experience have been identified as important in individual response to pain. Threshold refers to the point at which pain is first experienced; that is, the lowest level of sensation that produces a report of pain. Tolerance is the point at which an individual reports pain to be so intense that it can no longer be tolerated. Conflicting results have been reported regarding the relationship between pain threshold and pain tolerance. While Clark and Bindra (1956) reported a high correlation between the two concepts, Gelfand (1964), and Mersky and Spear (1967) report a low correlation between pain threshold and pain tolerance. Although these two response parameters are consistently measured in studies of laboratory induced pain, they have little relevance for clinical pain (Lander, Fowler-Kerry, & Hill, 1990). In the clinical area it is the person's subjective report that is the most reliable indicator of pain (Huskisson, 1974).

Age

The findings of studies that examine the relationship of age to pain are contradictory. Some studies indicate that pain sensitivity decreases and pain tolerance increases with age (Schludermann & Zubek, 1962; Sherman & Robillard, 1964). In contrast to these studies, others have shown that pain tolerance decreases with age (Woodrow, Friedman, Siegelaub & Collen, 1972). The contradiction in results could arise from the methods employed

to measure pain tolerance in laboratory research (Woodrow et al, 1972). When tolerance is measured using radiant heat (cutaneous stimulation) it increases with age. When measured using pressure on the Achilles tendon (deeper stimulation), tolerance decreases with age. The research suggests that as people grow older their tolerance to cutaneous pain increases and tolerance to deep pain decreases. If accurate, these conclusions could have important implications for pain management in the elderly.

In early studies of post-operative pain, no significant differences were found between the patient's perceived pain intensity and age (Beecher, 1946; Keats, 1956). Current clinical studies confirm the lack of correlation

between age and pain (Duggleby, 1990; Hargreaves, 1987; Harkins, 1988; Finlay, 1990; Taenzer, Melzack & Jeans, 1986) with the exception of one study where patients with persistent pain tended to be older (Melzack, Abbott, Zackon, Mulder, & Davis, 1987).

Gender

While at least one study has reported that pain threshold for men is higher than for women (Sherman & Robillard, 1960), other studies have not found a gender difference (Hardy, Wolff, & Goodell, 1952; Notermans & Tophoff, 1984). As for pain tolerance, laboratory studies generally find that men tolerate more pain than women (Hardy et al, 1952; Notermans et al, 1984, Woodrow et al, 1972). Woodrow et al (1972) further suggested that tolerance varies less among women than men. It could be that women are socialized to report pain more readily in a research situation than men are.

The majority of the studies cited used experimental designs in the laboratory to examine the influence of pain threshold, pain tolerance, age and gender on pain. However, neither visceral nor deep somatic pain are commonly chosen for study in the laboratory (Wolff, 1977). Clinical pain research on the other hand includes cutaneous, deep somatic and visceral pain. Analysis of gender effects for subjects with clinical pain has

failed to find sex differences in reported pain. (Lander, Fowler-Kerry, & Hill, 1990: Taenzer et al., 1986; Winefield, Katsikitis, Hart & Rounsefell, 1990). The discrepancies in findings for laboratory and clinical research suggests that gender differences in the laboratory are caused by demand characteristics; an experimental bias (Lander et al, 1990).

Culture

Various studies have shown that significant differences exist among ethnic groups in their response to and expression of pain (Lipton & Marbach, 1984; Morse & Morse, 1988; Sherman & Robillard, 1960; Woodrow et al, 1972; Zborowski, 1952). Variability may occur within ethnic groups (Lipton & Marbach, 1984). With few exceptions, studies on the sociocultural influences on pain have focused primarily on how ethnicity influences psychological, verbal and behaviourial reactions to pain (Bates, 1987). Such studies have generally not attended to the influence of sociocultural structuring of cognition on the physiological mechanisms of pain perception. The gate control theory strongly suggests that psychological and cognitive variables which are heavily influenced by ethnicity have an impact on the physiological processes involved in pain perception and response.

Psychological factors

It is known that psychological factors may influence the pain experience. Beecher (1955) was one of the earliest researchers to report that pain is influenced by anxiety and the meaning of the pain experience for the individual. A number of researchers found no significant relationship between post-operative pain and pre-operative anxiety state (Brugel, 1971; Taenzer et al., 1986; & Wolf and Davis, 1975). While these studies did not differentiate state from trait anxiety one study that did reported state anxiety to be significant in predicting post-operative pain (Scott, Clum & Peoples, 1983).

to the variety and complexity of factors that influence post-operative pain. According to Bonica (1990) the most important factors that influence the occurrence, intensity, quality and duration of post-operative pain include the following: (a) the site, nature and duration of the operation, the type of incision, and the amount of intra-operative trauma; (b) the physiologic and psychologic make-up of the patient; (c) the preoperative psychologic, physical and pharmacologic preparation of the patient; (d) the presence of serious complications related to the surgery; (e) the anaesthetic management before, during and after the surgery: and most importantly (f) the quality of post-operative care. The following studies are representative of research that has attended to at least some of these factors.

There are two distinct populations of patients on a surgical ward at any time (Melzack et al., 1987. There are patients who suffer post-operative pain without complications and whose pain usually resolves within three or four days, and those who develop post-surgical complications and whose pain persists beyond four days post-operatively. The latter category of patients comprise about one third of patients on a surgical ward.

Cohen (1980) reported that 75.2% of the patients interviewed three days post-operatively were in moderate to severe pain even though narcotic analgesics were available to them. Ninety percent of post-operative patients interviewed by Sriwatanakul, et al, (1983) reported having pain of sufficient intensity to disturb their sleeping, eating, concentrating, talking and mobility patterns. Although Krokosky and Reardon (1989) did not differentiate medical from surgical patients' response, 64% of the patients were having pain at any time. Of these patients 10% classified their pain as brief (less than 15 minutes); 36% as intermittent (comes and goes); and 54% as persistent (never free from pain).

Use of a retrospective chart analysis has been suggested as a means of determining degree of pain experienced, however, there are problems

associated with this approach. Several studies have demonstrated low correlations between physician or nurse ratings of patients' pain and patients' self-reports of pain. These same studies also report low correlations between physician or nurse ratings of patients' pain and the amount of analgesic administered (Camp & O'Sullivan, 1987; Cohen, 1980; Graffam, 1981, Pilowsky, Manzcap, & Bond, 1969; Teske, Daut, & Cleeland, 1983). In addition, the question arises as to whether or not information related to patients' pain is consistently charted. Consequently retrospective chart analysis may not provide a very accurate description of the incidence of post-operative pain.

There are problems inherent in using patients' self-reports of pain to determine the incidence of post-operative pain. Reading (1983) suggests that self-reports of pain may be subject to response bias or falsification. It has been suggested that patients minimize their pain to avoid receiving medication (Daut & Cleeland, 1982; Sriwatanakul et al., 1983; Winefield et al., 1990). In one study, nurses thought that about 17% of patients minimize their pain (Lander, 1990). Minimization of pain may be related to fears of addiction that patients have (Cohen, 1980; Winefield et al., 1990). However, neither the proportion of patients who minimize or maximize pain nor possible causes of this behaviour has been fully investigated.

Management of Post-Operative Pain

There are many reasons for not permitting people to suffer from pain which could be controlled or reduced. Pain that is not well controlled can adversely affect physiological functioning by interfering with the effectiveness of respiratory, gastrointestinal and circulatory systems (Bonica, 1990). Pain can also compromise psychological functioning. People report a reduction in activity level, increased prevalence of sleep disorders, fatigue, anorexia, anxiety, depression, loneliness and decreased concentration (Bonica, 1990; Sriwatanakul et al., 1983).

Recent advances in pain management have led to the development of new interventions. Various non-pharmaceutical interventions including relaxation (Graffam & Johnson, 1987; Laframboise, 1990; Wells, 1982), transcutaneous electrical nerve stimulation (Hargreaves, 1987; Finlay, 1990; Nelson & Planchock, 1990), and music (Angus & Faux, 1990; Locsin, 1981) have been described as effective in the management of post-operative pain. There is no research describing the frequency of use of these strategies.

Pharmacological therapy including the use of opioids, nonsteroidal anti-inflammatory agents, and adjuvant analgesic drugs continue to form the mainstay in the treatment of post-operative pain. Of these, opiate alkaloids form the cornerstone of post-operative analgesic therapy. Despite the potential efficacy of opioid therapy in the management of post-operative pain, evidence exists that post-operative pain is not well managed using these preparations (Angell, 1982; Cohen, 1980; Marks & Sachar, 1973; Melzack, et al., 1987; Sriwatanakul et al., 1983; Weis, Sriwatanakul, Alloza, Weintraub, & Lasagna, 1983).

Factors contributing to the inadequate management of post-operative pain with opioids include: the underprescription of opioids by physicians (Grossman & Sheilder, 1985; Marks & Sachar, 1973; Twycross, 1984); administration of opioids less frequently than permitted by physician order (Cohen, 1980; Marks & Sachar, 1973; Sriwatanakul et al., 1983; Twycross, 1984); and fears of addiction and respiratory depression (Cohen, 1980; Marks & Sachar, 1973; Sriwatanakul et al., 1983; Twycross, 1984; Weis et al., 1983; Winefield et al., 1990). These factors can be primarily attributed to the inadequate or improper application of knowledge about opioids by involved practitioners. In addition, decisions about administration of opioids is related in part to the complex interaction of patient and practitioner characteristics, behaviors and beliefs.

Patient influences

Various patient characteristics have been studied for their influence on both the inferences about and management of clinical pain. As mentioned previously, differences exist among ethnic groups in their response to and expression of pain (Lipton & Marbach, 1984; Zborowski, 1952). There is further evidence that ethnic background of the patient may influence practitioner inferences about pain (Davitz & Davitz, 1980). According to these researchers practitioners infer that patients of Oriental, Anglo-Saxon and Germanic origins experience decreased physical pain compared to Jewish or Spanish patients given the same conditions. The study was not exhaustive and the sample size was small therefore the results are not generalizable.

Studies related to the influence of gender of the patient on practitioner inferences of suffering have yielded conflicting results. While some researchers have found no gender differences (Oberst, 1978), others have reported that nurses believe females to suffer more pain than males (Davitz & Davitz, 1980). In contrast, Cohen (1980) reports that nurses believe females should receive less opioid analgesic than males with the same problem. In actuality, male and female patients were given similar amounts of analgesics following surgery (Hargreaves, 1987; Lander et al., 1989).

In general, old and young patients are prescribed and receive fewer analgesics post-operatively than any other patients (Faherty & Grier, 1984; Baeyer et al., 1983; Schechter et al., 1986; Melzack et al., 1987; Mason, 1981). In apparent contradiction are the findings that younger (Davitz & Pendelton, 1967 & Mason, 1981) and older patients (Oberst, 1978) are perceived by nurses to suffer more than other patients. Only Dudley & Holm (1984) reported no significant influence of patient age on nurses' beliefs about pain suffering.

The time interval following surgery has been negatively correlated to the amount of analgesic administered (Hargreaves, 1987). Duration of

pain has been reported to influence inferences about the amount of pain a patient is experiencing. When duration of pain was long term, less intense pain was inferred by nurses (Taylor, Skeleton & Butcher, 1983). Further, nurses infer greater pain to patients with cardiovascular disease and to those who have undergone severe trauma (Davitz & Davitz, 1980; Dudley & Holm, 1984).

Practitioner influences

Various characteristics of nurses have been studied as factors in nurses' inferences about patients' pain. Age of the nurse did not have a significant effect on inferences about pain (Davitz & Davitz, 1981; Dudley & Holm, 1984; Mason, 1981; Oberst, 1978). Educational preparation (Davitz & Davitz, 1980; Dudley & Holm, 1984; Mason, 1981; Oberst, 1978), area of specialization (Davitz & Pendelton, 1969; Mason, 1981; Oberst, 1978) and marital status (Oberst, 1978) were also unrelated.

The findings of Davitz & Pendelton (1969) and Oberst (1978) suggest no relationship between years of experience and inferences about pain. In contrast, Mason (1981) reports that while years of experience did not affect the nurses' inferences of psychological suffering, it did influence the inference of physical suffering. Nurses with less than one year of nursing experience infer a higher degree of physical pain than did nurses with 6-10 years of experience. These findings suggest that the possibility that faulty clinical judgement increases with experience. This suggestion is congruent with research that has been done in other disciplines. Using heuristic reasoning as a model for clinical decision making, researchers suggest that as people gain more knowledge, confidence in decision making increases. (Oscamp, 1965). Unfortunately, confidence has been inversely correlated with accuracy in judgement (Nisbett & Ross, 1980).

Nurses from different ethnic backgrounds were found to differ in their inferences about pain. Nurses from Japan and Korea rated patients' physical pain and psychological distress higher than those from Puerto

Rico, Taiwan, Thailand and the United States (Davitz, Sameshima & Davitz, 1976). Davitz & Pendelton (1969) found no significant differences between American white and American black nurses in their ratings of patients' suffering. In addition, nurses whose family backgrounds were Italian, Polish, Russian, Spanish or African judged patients to suffer more pain than nurses from English, Irish, Scandinavia or German backgrounds (Davitz & Davitz, 1980).

In one study, researchers reported that nurses of lower socioeconomic status inferred more suffering than did nurses of higher status (Oberst, 1978). Nurses inferences about pain are reflected in how nurses actually rate patients' pain. Nurses' pain ratings correlate positively with how they rate their own pain (Davitz & Davitz, 1980).

Researchers have reported that nurses do not consider total pain relief to be one of their goals (Cohen, 1980; Donovan & Dillon, 1987; Ketovuori, 1987; Romyn, 1990; Watt-Watson, 1987).

Nurse-patient ratings of pain

Graffam (1981) studied the congruence in nurse-patient expectations of the management of pain using nonparticipant observation and interviewing techniques. She reported congruence in nurse-patient expectations about the occurrence and severity of pain but significant disparity in nurse-patient ratings of pain. Where there was disagreement, 80% or more of the patients judged the pain to be more severe both before and after a relief measure. Similar results have been reported by other researchers (Ketovuori, 1987 & Teske, Daut & Cleeland, 1983). Nurses' assessment of the pain was minimal and ratings were based on the patients' appearance and behaviour with little or no validation (Graffam, 1981 & Ketovuori, 1987). A lack of correspondence between observer inference and patient self-report of pain has also been noted (Teske et al., 1983).

Several researchers suggested that if nurses only rely on nonverbal pain behaviors, patients are likely to be under treated with analgesics. The reason for this is that nurses tend to minimize pain when utilizing

nonverbal as compared to verbal patient behaviors (Baer, Davitz, & Lieb, 1970; Cohen, 1980; Lenburg, Glass, & Davitz, 1970; Teske et al., 1983). Other research offers further support (Baeyer, Johnson & McMillan, 1984). High nonverbal expressiveness of patients resulted in high ratings of pain and distress by nurses. However nonverbal expressiveness had no significant impact on psychological support or nursing interventions offered to the patients.

Nurses' tend not to record their assessments of pain (Camp, 1985; Cohen, 1980; Fox, 1982; Ketovuori, 1987). It has also been noted that the administration of a medication was the single relief measure most often used by nurses (Graffam, 1981). It is not clear in any of the studies mentioned whether nurses simply failed to document their assessments or failed to assess and document patients' pain. Since only 3% of a sample of graduate and nursing students have been shown to use a standard approach to assessment of patients' pain inadequate assessment appears to be a problem (Watt-Watson, 1987).

Small sample sizes and nonrandom selection of subjects limits the generalizability of the findings obtained in many of the previous studies. In many cases the influence of a single variable on nurses' inferences about suffering was the only aspect studied. Even though statistically significant results were often reported, an examination of the interaction of several variables may be necessary in order to develop more useful theories regarding nurses' inferences about suffering (Oberst, 1978). Many of the various patient and practitioner characteristics that have been studied are not suitable for manipulation. It is imperative therefore that further research attend to those factors that are suitable for intervention (Lander, 1990).

The use of vignettes as the primary data source (Davitz & Davitz, 1980; Mason, 1981; Oberst, 1978; von Baeyer et al., 1984) in much of the research in this area is problematic. Responses to vignettes may not be similar to those obtained in the clinical setting. In the clinical area,

nurses would have the opportunity to verify clues and seek additional data.

Nurses' educational preparation

The relationship between nurses inferences about suffering and the length of time in an educational program or amount of nursing experience have been examined (Lenbur, Burnside & Davitz, 1970; Mason, 1981; & von Baeyer, et al., 1984). Students' ratings of patient pain (Lenbur, et al., 1970) and distress (von Baeyer et al., 1984) were inversely related to the amount of nursing experience. The same is true of graduate nurses: the more experience they have, the less physical suffering they infer (Mason, 1981). The type of educational preparation does not seem to be related to inferences about suffering (Dudley & Holm, 1984; Mason, 1981; Oberst, 1978).

The only major study examining the curriculum content related to pain was completed using a random sample of 390 baccalaureate nursing programs accredited by the United States National League for Nursing (Graffam, 1990). Eighty percent of programs included some formal content on pain and this was integrated into several courses. Eight percent of programs offered a course in the theory of pain and pain management. The courses were equally divided between required and elective. The actual time devoted to the discussion of pain varied greatly, ranging from less than 2 hours in the entire curriculum to more than 15 hours. The mode was 4 hours devoted to discussion about pain.

A smaller study involving the deans of 23 nursing faculties in Canadian Universities reports that 48% of the nursing curricula had no content or less than 3.5 hours of content related to the topic of pain (Watt-Watson, 1989). The limited attention to the study of pain in nursing curricula is reflected in the findings of Winefield et al, (1990) who reported that 50% of practitioners indicated they had been adequately educated in pain control.

Romyn (1990) studied the knowledge level and decisions of a convenience sample of volunteer students regarding the management of pain with narcotic analgesics. Decisions about administration of narcotic analgesics in the management of pain were not based on accurate knowledge. For post - RN baccalaureate students, knowledge and decisions did not improve with experience in nursing. Although hospital, college and university programs were included in the study, no significant differences in knowledge or decisions were found.

The importance of providing students with accurate information related to opioid analgesia during their basic nursing education is supported by findings that experience in nursing does not necessarily result in improved knowledge and clinical decisions. In order for students to be exposed to this knowledge, nursing faculty must be knowledgeable themselves. There is no documented research related to an assessment of nurse educators' knowledge level and/or attitude pertaining to the use of opioid analgesia management of pain.

Summary and Conclusions

There is little doubt that patients suffer pain following surgery but there is little known about the actual incidence of this pain. Results of several studies suggest that patients' and nurses' ratings of pain differ significantly. It is also well documented that post-operative pain is not well managed despite advances in knowledge of pain management. However, it is important to note that while the results of these studies are relatively consistent, it could be because most researchers have used the same instrument or a variation of that instrument (Lander, 1990). Unfortunately the validity and reliability of the instrument has not been documented.

One of the problems in the management of post-operative pain is undertreatment with opioid analgesics, yet little is known about why this situation exists. Although the administration of opioid analgesics is related in part to the inferences that nurses make regarding patients'

pain, the results of studies designed to examine factors that influence nurses inferences about suffering are inconclusive and in some cases methodologically flawed. Further investigation is required to identify these factors and the interrelationship of these factors to selection of pain management strategies.

It has been suggested that since nurses' knowledge deficits and attitudes contribute to the situation of inadequate control of post-operative pain, education is the key to improving the management of post-operative pain. It follows then that educational practices related to pain management warrant investigation. More specifically, if students do not have the knowledge on graduation, curriculum content and nurse educator knowledge and attitude require closer scrutiny.

References

Angell, M. (1982). The quality of mercy. The New England Journal of Medicine, 306, 98-99.

Angus, J.m & Faux, S. (1990). The effect of music on adult post-operative patients' pain during a nursing procedure. In Funk, S., Tournquist, E., Champagne, M., Copp L., & Weise, R., (Eds.), Key Aspects of Comfort: Management of Pain, Fatigue, and Nausea (pp 166-173).

Baer, E., Davitz, L.J., & Lieb, R. (1970). Inferences of physical pain and psychological distress in relation to verbal and nonverbal patient communication. Nursing Research, 19, 388-392.

Bates, M.S. (1987). Ethnicity and pain: A biocultural model. Social Science and Medicine, 24(1), 47-50.

Beyer, J., DeGood, D., Ashley, L., & Russell, G. (1983). Patterns of postoperative analgesic use with adults and children following cardiac surgery. Pain, 17, 71-81.

Bonica, J. (1990). The Management of Pain. Philadelphia: Leanfebinger.

Bruegl, M.A. (1971). Relationship of preoperative anxiety to perception of postoperative pain. Nursing Research, 20(1), 26-31.

Camp, L.D., & O'Sullivan, P.S. (1987). Comparison of medical, surgical and oncology patients' descriptions of pain and nurses' documentation of pain assessments. Journal of Advanced Nursing, 12, 593-598.

Charap, A.D. (1978). The knowledge, attitudes, and experience of medical personnel treating pain in the terminally ill. Mount Sinai Journal of Medicine, 45, 561-580.

Chapman, W.P., & Jones, C.M. (1944). Variations in cutaneous and visceral pain sensitivity in normal subjects. Journal of Clinical Investigation, 23, 81.

Clark, J.W., & Bindra, D. (1956). Individual differences in pain thresholds. Canadian Journal of Psychology, 10, 60-76.

Cohen, F.L. (1980). Postsurgical pain relief: Patients' status and nurses' medication choices. Pain, 9, 265-274.

Cohen, F., & Lazarus, R.S. (1975) Active coping processes, coping dispositions, and recovery from surgery. In Weisenberg, M., (Ed.) Pain: clinical and experimental perspectives. Saint Louis: C.V. Mosby Company.

Craig, K.D. (1984). Emotional aspects of pain. In P. Wall and R. Melzack (Eds.), Textbook of pain (pp. 153-161). New York: Churchill-Livingston.

Daut, R.L., & Cleeland, C.S. (1982). The prevalence and severity of pain in cancer. Cancer, 50, 1913-1918.

Davitz, L., & Davitz, J.R. (1980). Nurses' responses to patients' suffering. New York: Springer Publishing Company.

Davitz, L.J., & Pendleton, S.H. (1969). Nurses' inferences of suffering. Nursing Research, 18, 100-107.

Da, L.J., Sameshima, Y., & Davitz, J.R. (1976). Suffering as viewed in six different cultures. American Journal of Nursing, 76, 1296-1297.

Donovan, M.I. (1989). An historical view of pain management: How we got to where we are! Cancer Nursing, 12, 257-261.

Donovan, M.I., & Dillon, P. (1987). Incidence and characteristics of pain in a sample of hospitalized cancer patients. Cancer Nursing, 10(2), 85-92.

Dudley, S.R., & Holm, K. (1984). Assessment of the pain experience in relation to selected nurse characteristics. Pain, 18, 179-186.

Duggleby, W. (1990). PCA for Total Hip Arthroplasty Patients. Unpublished Masters Thesis: University of Alberta.

Faherty, B., & Greir, M. (1984). Analgesic medication for elderly people post- surgery. Nursing Research, 33, 369-372.

Finlay, L. (1990). ALTENS VS CTENS for Post-Thorocotomy pain. Unpublished Master's Thesis: University of Alberta.

Fox, L.S. (1982). Pain management in the terminally ill cancer patient: An investigation of nurses' attitudes, knowledge, and clinical practice. Military Medicine, 147, 455-460.

Gelfand, S. (1964). The relationship of experimental pain tolerance to pain threshold. Canadian Journal of Psychiatry, 18, 36-42.

Graffam, S. (1981). Congruence of nurse-patient expectations regarding intervention in pain. Nursing Leadership, 4(2), 12-15.

Graffam, S. & Johnson, A. (1987). A comparison of two relaxation strategies for the relief of pain and its distress. Pain, 2, (4), 229-231.

Graffam, S. (1990). Pain content in the curriculum-A survey. Nurse Educator, 15, (1), 20-23.

Grossn S., & Scheidler, V. (1985). Skills of medical students and house officers in prescribing narcotic medications. Journal of Medical Education, 60, 552-557.

Hardy, J., Wolff, H., & Goodell, H. (1952). Pain sensations and reactions. Baltimore: Williams & Wilkins.

Hargreaves, S. (1987). Implementing TENS to control post-operative pain. Unpublished Master's Thesis, University of Alberta.

Hargreaves, A., & Lander, J. (1989). Use of transcutaneous electrical nerve stimulation for postoperative pain. Nursing Research, 38(3), 159-161.

Harkins, S.W. (1988). Pain in the elderly. In Dubner, R., Gebhart, G.F., & Bond, M.R., (Eds.). Proceedings of the 5th World Congress on Pain, 355-367.

International Association for the Study of Pain. (1986). Pain terms: A current list with definitions and notes on usage. Pain [Suppl], 3, S216

Johnson, J.E ., & Rice, V.H. (1974). Sensory and distress components of pain:Implications for the study of clinical pain. Nursing Research, 23(3), 203-209.

Johnson, M. (1977). Assessment of clinical pain, In Jacox, A. (Ed.), Pain: A sourcebook for nurses and other health professionals. Boston: Little, Brown & Co.

Ketovuori, H. (1987). Nurses' and patients' conceptions of wound pain and the administration of analgesics. Journal of Pain and Symptom Management, 2(4), 213-218.

Krokosky, N.J., & Reardon, R.C. (1990). The accuracy of nurses' and doctors' perceptions of patient pain. In Funk, S., Tournquist, E., Champagne, M., Copp, L., & Weise, R., (Eds.), Key Aspects of Comfort: Management of Pain, Fatigue and Nausea, (pp. 127-134).

Laframboise, J. (1990). The effect of relaxation training on surgical patients' anxiety and pain. In Funk, S., Tournquist, E., Chamagne, M., Copp, L., & Weise, R., (Eds.), Key Aspects of Comfort: Management of Pain, Fatigue, and Nausea (pp. 155-160).

Lander, J., Fowler-Kerry, S., & Hill, A. (1990). Comparison of pain perception among males and females. The Canadian Journal of Nursing Research, 22(1), 39-49.

Lander, J. (1990). Fallacies and phobias about addiction and pain. British Journal of Addiction, 85, 803-809.

Lander, J., Fowler-Kerry, S., & Hargreaves, A. (1990). Gender effects in pain perception. Perceptual Motor Skills, 68, 1089-1090.

Lenburg, C.B, Burnside, H., & Davitz, L.J. (1970). Inferences of physical pain and psychological distress in relation to length of time in nursing education program. Nursing Research, 19, 400-401.

Lenburg, C.B., Glass, H.P., & Davitz, L.J. (1970). Inferences of physical pain and psychological distress in relation to the stage of the patients' illness and occupation of the perceiver. Nursing Research, 19, 392-398.

Liebeskind, J., & Melzack, R. (1987). The International Pain Foundation: Meeting a need for education in pain management. Pain, 30, 1-2.

Lindeman, C.A., & Aernam, B.V. (1971) Nursing intervention with the pre-surgical patient - The effects of structured and unstructured preoperative teaching. Nursing Research, 20(4), 319-332.

Locsin, R.G. (1981). The effect of music on the pain of selected post-operative patients. Journal of Advanced Nursing, 6, 19-25.

Lipton, J.A., & Marbach, J.J. (1984). Ethnicity and the pain experience. Social Science and Medicine, 19, 1279-1298.

Marks, R.M., & Sachar, E.J. (1973). Undertreatment of medical inpatients with narcotic analgesics. Annals of Internal Medicine, 78, 173-181.

Mason, D.J. (1981). An investigation of the influences of selected factors on nurses' inferences of patient suffering. International Journal of Nursing Studies, 18, 251-259.

McCaffery, M. (1979). Nursing management of the patient with pain (2nd ed.). Philadelphia: Lippincott.

Melzack, R., Abbott, F., Zackon, W., Mulder, D., & Davis, M. (1987). Pain on a surgical ward: A survey of the duration and intensity of pain and effectiveness of medication. Pain, 29, 67-72.

Melzack, R., & Casey, K.L. (1968). Sensory, Motivational, and central control determinants of pain: A new conceptual model. In D. Kenshalo, (Ed.), The skin senses. Springfield, IL: Chas. C Thomas, p. 423.

Melzack, R., & Wall, P.D. (1965). Pain Mechanisms: A new theory. Science, 150(3699), 971-979.

Melzack, R., & Wall, P.D. (1988). The challenge of pain. London: Penguin Books.

Merskey, H., & Spear, F.G. (1967). Pain: Psychological and psychiatric aspects. London: Bailliere, Tindall & Cassell.

Morse, J.M., & Morse, R.M. (1988). Cultural variation in the inference of pain. Journal of Cross-Cultural Psychology, 19(2), 232-242.

Mulcahy, R.A., & Janz, N. (1973). Effectiveness of raising pain perception threshold in males and females using a psychoprophylactic childbirth technique during induced pain. Nursing Research, 22(5), 423-427.99

Nisbett, R., & Ross, L. (1980) Human Inference: Strategies and Shortcomings. Englewood Cliffs, NJ: Prentice-Hall.

Notermans, S.L.H., & Tophof, M.M.W.A. (1975). Sex difference in pain tolerance and pain appreciation. In M. Weisenberg (Ed.), Pain: Clinical and experimental perspectives. Saint Louis: C.V. Mosby Company.

Oberst, M.T. (1978). Nurses' inferences of suffering: The effects of nurse-patient similarity and verbalizations of distress. In M.J. Nelson (Ed.), Clinical perspectives in nursing research (pp. 38-60). New York: Teachers College Press.

Oskamp, S. (1965). Overconfidence in case-study judgments. Journal of Consulting Clinical Psychologists, 29, 261-265.

Pilowsky, I., Manzcap, D., & Bond, M. (1969). Pain and its management in malignant disease. Psychosomatic Medicine, 31, 400-404.

Procacci, P., Bozza, G., Buzzelli, G., & Corte, M.D. (1975). The cutaneous pricking pain threshold in old age. In M. Weisenberg (Ed.), Pain: Clinical and experimental perspectives. Saint Louis: C.V. Mosby Company.

Reading, A.E. (1983). Pain measurement and experience. Journal of Psychosomatic Research, 27, 415-420.

Schludermann, E., & Zubek, J.P. (1962). Effect of age on pain sensitivity. Perceptual and Motor Skills, 14, 295-301.

Schmitt, F.E., & Wooldridge, P.J. (1973). Psychological preparation of surgical patients. Nursing Research, 22(2), 108-115.

Scott, L.E., Clum, G.A., & Peoples, J.B. (1983) Preoperative predictors of postoperative pain. Pain, 15, 283-293.

Schechter, N., Allen, D., & Hanson, D. (1986). The status of pediatric pain control: A comparison of hospital analgesic usage in children and adults. Pediatrics, 77, 11-15.

Sherman, E.D., & Robillard, E. (1964). Sensitivity to pain in the aged. Canadian Medical Association Journal, 83, 944-947.

Sriwatanakui, K., Weis, O.F., Alloza, J.L., Kelvie, W., Weintraub, M., & Lasagna, L. (1983) Analysis of narcotic analgesic usage in the treatment of postoperative pain. Journal of the American Medical Association. 250(7), 926-929.

Sternbach, R.A. (1960). Pain: A psychophysiological analysis. p. 12. New York: Academic Press.

Sternbach, R.A., & Tursky, B. (1965). Ethnic differences among housewives in psychophysical and skin potential responses to electric shock. Psychophysiology, 1, 241-246.

Strauss, A., Fagerhaugh, S.Y., & Glaser, B. (1974). Pain: an organizational-work-interactional perspective. Nursing Outlook, 22, 560-566.

Sweeney, S.S. (1977). Pain associated with surgery. In Jacox, A.K., (Ed.). Pain: A Source Book for Nurses and Other Health Professionals. Boston: Little, Brown and Company, (pp. 329-347).

Taenzer, P., Melzack, R., & Jeans, M.E. (1986). Influence of psychological factors on postoperative pain, mood and analgesic requirements. Pain, 24, 331-342.

Taylor, A.G., Skelton, J.A., & Butcher, J. (1984) Duration of pain condition and physical pathology as determinants of nurses' assessments of patients in pain. Nursing Research, 33, 4-8.

Teske, K., Daut, R.L., & Cleeland, C.S. (1983). Relationships between nurses' observations and patients' self-reports of pain. Pain, 16, 289-296.

Twycross, R.G. (1984). Narcotics. In Melzack R. & Wall, P. (Eds.) Textbook of Pain (pp. 514-525). New York: Churchill-Livingston.

von Baeyer, C., Johnson, M., & McMillan, M. (1984). Consequences of nonverbal expression of pain: Patient distress and observer concern. Social Science and Medicine, 19, 1319-1324.

Watt-Watson, J.H. (1987). Nurses' knowledge of pain issues: A survey. Journal of Pain and Symptom Management, 2, 207-211.

Watt-Watson, J.H. (1987). Pain curriculum. Canadian Nurse 85(9), 44-46.

Weis, O.F., Sriwatanakui, K., Alloza, J.L., Weintraub, M., & Lasagna, L. (1983). Attitudes of patients, housestaff and nurses toward postoperative analgesic care. Anesthesia and Analgesia, 62, 70-74.

Wells, M.N. (1982). The effect of relaxation on postoperative muscle tension and pain. Nursing Research, 31(4), 236-238.

Winefield, H.R., Katsikitis, M., Hart, L.M., & Rounsefell, B.F. (1990) Postoperative pain experiences: relevant patient and staff attitudes. Journal of Psychosomatic Research, 34(5), 543-552.

Wolfer, J.A., & Davis, C.E. (1975). Assessment of surgical patients' preoperative emotional condition and postoperative welfare. In Weisenberg, M., (Ed.). Pain: clinical and experimental perspectives. Saint Louis: C.V. Mosby Company.

Wolff, B. (1977). The role of laboratory pain induction methods in the systematic study of human pain. Acupuncture and Electro Therapeutics Research, 2, 271-305.

Woodrow, K.M., Friedman, G.D., Siegelaub, A.B., & Collen, M.F. (1972). Pain tolerance: Differences according to age, sex and race. Psychosomatic Medicine, 34, 548-556.

Zborowski, M. (1952). Cultural components in responses to pain. Journal of Social Issues, 8(16), 16-30.

Appendix B

1. Please indicate the type of nursing program that you teach in. If you teach in more than one program, check the primary program where you teach. Use this program as a basis for your responses to the questions in this survey.

   Check only one.

   ____ hospital

   ____ college

   ____ university

2. Some educators say there is a need to change the amount of pain content in their curricula, others say there is no need to change. What is your opinion?

   ____ increase the amount of pain content

   ____ decrease the amount of pain content

   ____ maintain the current amount of content

   ____ other (please specify)

   _____

   _____

3. In the past year, did you or did you not teach about pain and pain management in the classroom and/or clinical setting?

   ____ yes [Go to question 4]

   ____ no [Go to question 14]

4. How many hours did you teach about pain and pain management in the classroom and/or clinical setting?

   ____ hours in the classroom

   ____ hours in clinical

5. Check all of the following which describe your teaching about pain and pain management. Discussions with students:

____ are part of a separate course

____ are part of a plan to thread the content through several courses in the curriculum

____ are self initiated informal discussions

____ other (please specify)

_____

_____

_____

_____

Questions 6 to 9 refer to clinical situations that may be encountered by your students.

6. A patient is given Demerol 100 mg every 4 hours for 10 days. A student wants to know what the risk is of this patient becoming addicted to Demerol. Circle the answer which best represents your response. (1=little possibility of becoming addicted; 7=great possibility of becoming addicted)

1	2	3	4	5	6	7
Little Possibility						Great Possibility

7. A student is caring for a postoperative patient who continues to experience pain despite being given narcotic analgesics. The patient also has an order for Phenergan. The student wants to know whether or not Phenergan will potentiate the analgesic effect of the narcotic.(1=little possibility of potentiation of analgesic effect; 7=great possibility of potentiation of analgesic effect)

1	2	3	4	5	6	7
Little Possibility						Great Possibility

8. A student requests your guidance in deciding how to handle the following situation.

   The student is caring for a postoperative patient. It is the first day following major abdominal surgery and there are no postoperative complications. An order has been written for Demerol 75-125 mg IM q 3-4h PRN. The patient last received Demerol 75 mg at 0800 hours.

   (a) It is now 1100 hours and the patient is reporting severe abdominal pain. Should the student administer Demerol at this time?

   ____ yes [Go to 8 (b)]

   ____ no [Go to 8 (c)]

   (b) How much Demerol should the student give?

   ____ mg

   (c) On reassessment, the patient continues to report pain. The next time at which the student should administer the next dose of Demerol is:

   ____ hours

   (d) How much Demerol should the student administer?

   ____ mg

   (e) Assuming the patient continues to have severe pain throughout the day, what are the total number of doses this patient should receive in a 24 hour period?

   ____ doses

9. A student is caring for a postoperative patient. It is the first day following major orthopedic surgery and there are no post-operative complications. An order has been written for morphine 7.5-15 mg IM.

   Routine administration means that the drug is given at <u>regular</u>, specified intervals around the clock (like antibiotics). PRN administration means that the drug is given when needed (like ant-nausea drugs).

   (a) Do you think that the morphine should be given to this patient on a routine or prn basis?

   ____ routine basis ____ prn basis

   (b) Which of the following intervals do you feel is most appropriate for this patient?

   ____ 2-3 hours

   ____ 3-4 hours

   ____ 4-6 hours

10. The range of analgesic effect means the duration of time that an analgesic provides relief. In a recent survey, students were asked to identify the range of analgesic effect of Demerol. Students could be placed in 1 of 3 groups on the basis of their response.

    Group A: About 1/3 said 2-3 hours

    Group B: About 1/3 said 3-4 hours

    Group C: About 1/3 said 4-6 hours

    Which group or groups of students would you identify as requiring remedial instruction?

    ____ Group A

    ____ Group B

    ____ Group C

Regardless of what they have been taught, students may not retain information. For Questions 11 to 13, consider students who are ready to graduate from your program. what answers do you think they would give to the questions?

11. Consider that Demerol has been ordered for a patient who is taking an MAO inhibitor drug such as phenelzine (Nardil). What would the average student say is the possibility of a toxic reaction? (1=little possibility of toxic reaction; 7=great possibility of toxic reaction)

    1 2 3 4 5 6 7

    Little Possibility — Great Possibility

    Do you think that this average student would be correct or incorrect?

    ____ correct ____ incorrect

12. Consider that Elavil (a tricyclic antidepressant) has been ordered for a patient in pain who is also anxious. What would the average student say is the possibility that Elavil will decrease the amount of narcotic analgesic required? (1=little possibility that the analgesic requirements will decrease; 7=great possibility that analgesic requirements will decrease)

    1 2 3 4 5 6 7

    Little Possibility — Great Possibility

    Do you think that this average student would be correct or incorrect?

    ____ correct ____ incorrect

13. A hospitalized patient becomes nauseated following each dose of morphine. Dimenhydrinate (Gravol) is ordered to decrease nausea. what would the average student say is the possibility that simultaneous administration of Gravol and morphine will decrease the amount of morphine required.? (1=little possibility that analgesic requirements will decrease; 7=great possibility that analgesic requirements will decrease)

1	2	3	4	5	6	7
Little Possibility						Great Possibility

Do you think that this average student would be correct or incorrect?

____ correct ____ incorrect

14. Suppose students in your program were given a 10 item examination on basic working knowledge of pain management with narcotic analgesics. How do you think they would do?

I believe the average student would answer ____ out of 10 questions correctly.

15. Consider students who are about to graduate from your program. How well prepared do you think the average student is to be able to manage pain?

1	2	3	4	5	6	7
Poorly Prepared						Well Prepared

16. Some educators feel very knowledgeable about pain and pain management, while others don't feel very knowledgeable. How do you feel?

1	2	3	4	5	6	7
Not Very Knowledgeable						Very Knowledgeable

The remaining questions are about you.

17. Considering the following groups of courses, which groups(s) of courses describes what you teach?

A	B	C
Obstetrics	Pathophysiology	Adminstration
Pediatrics	Anatomy/Physiology	Research
Medical	Pharmacology	Teaching/Learning
Surgical	Growth/Development	History
Critical Care	Physical/Health Assessment	Professional Development
Emergency		Communication
Geriatrics		
Psychiatry		
Community Health		

Check each group that applies to you

____ Group A

____ Group B

____ Group C

18. How many years of equivalent full-time experience do you have working as a nurse providing direct patient care in the clinical setting? For example, a nurse who graduated in 1982 and worked full-time all of 1982, 1983, 1984 and half-time all of 1989, would have worked 3.5 years).

____ years of experience as a nurse in the clinical setting.

19. In what year did you last work as a nurse in the clinical setting?

19____

20. How many years of experience do you have working in a nursing education setting?

____ years of experience as a nurse educator.

21. If you have clinical responsibilities with your students, what is your primary area of clinical responsibility with your students? (Check only one)

____ medical/surgical

____ critical care

____ emergency

____ maternal/newborn

____ psychiatric/mental health

____ pediatrics

____ geriatrics/gerontology

____ community health/homecare

____ several clinical areas

22. Using the accompanying map as a reference, please indicate the AARN district that you work in.

____ North

____ North Central

____ Central

____ South Central

____ South

23. If there are any comments you would like to make about pain management in education or clinical practice, please make them here or on the back page.

Thank you very much for your participation in this study.

Appendix C

Nurse Educators
Province of Alberta

Dear Nurse Educator:

The International Pain Association, which is an inter-disciplinary group, has recently identified an urgent need for research about education related to pain management. Currently we have meagre knowledge about nursing education related to this subject. Moreover, most of what is known relates to American rather than Canadian nursing education programs. As a response to this need for information, I am conducting a study to document nurse educators' views about pain management content in nursing education programs.

I invite you and encourage you to participate in this survey. Your views about pain management content in nursing curricula are vital to this study, for it is important that the results truly reflect views of all nurse educators in Alberta. I hope you will consider taking about 10 to 15 minutes of your time to complete the enclosed questionnaire. A stamped return envelope is enclosed.

Your name was selected from the list of AARN members who are active practising nurse educators in the Province of Alberta. In order to protect your identity, the AARN has mailed my letter to you. I do not know your name or where you work. Any information which you do provide will kept confidential.

Nurses in Alberta are well known for their commitment to improving nursing knowledge and nursing practice. I hope that you will choose to express your views about pain management content in nursing education programs by participating in this survey. Results of the study will be made available through the Faculty of Nursing, University of Alberta , and the AARN library.

Sincerely,

Bev Williams, MN Candidate
Faculty of Nursing, University of Alberta
Tel: 492-6317

Thesis Supervisor: Dr. Janice Lander
Faculty of Nursing, University of Alberta
Tel: 492-6317

Appendix D

Correct responses to knowledge and decision items

Question # on questionnaire	Correct Response	References
6	1	Marks & Sachar, 1973; Porter & Jick, 1980 Twycross, 1984;
7	1	Jaffe & Martin, 1975; Marks & Sachar, 1973; McGee & Alexander, 1979; Moore & Dundee, 1961; Twycross, 1984
10	B & C	Benedetti & Butler, 1990; Butler, 1986; Jaffe & Martin, 1975; Twycross, 1984
11	7	Jaffe & Martin, 1975 Marks & Sachar, 1973; Twycross, 9184
12	7	Spiegel, Kalb & Pasternak, 1983; Stauffer, 1987; Twycross. 1984
13	1	American Pain Society, 198

8a	yes	Benedetti & Butler,1990; Butler, 1986; Charap, 1978; Jaffe & Martin, 1975; Twycross, 1984
8b	125 mg	Benedetti & Butler, 1990; Butler, 1986; Charap, 1978; Jaffe & Martin, 1975; Twycross, 1984
8c	3 hr	Benedetti & Butler,1990; Butler, 1986; Charap, 1978; Jaffe & Martin, 1975; Twycross, 1984
8d	125 mg	Benedetti & Butler,1990; Butler, 1986; Charap, 1978; Jaffe & Martin, 1975; Twycross, 1984
8e	8 doses	Benedetti & Butler,1990; Butler, 1986; Charap, 1978; Jaffe & Martin, 1975; Twycross, 1984
9a	routine	Charap, 1978 Twycross, 1984
9b	3-4 hr	Benedetti & Butler, 1990; Jaffe & Martin, 1975; Twycross, 1984