Original Article

Development and Testing of the Pain Opioid Analgesics Beliefs Scale in Taiwanese Cancer Patients

Yeur-Hur Lai, RN, PhD, Jo Ann Dalton, RN, EdD, Michael Belyea, PhD, Mei-Ling Chen, RN, PhD, Li-Yun Tsai, RN, MSN, and Shu-Ching Chen, RN, MSN

College of Nursing, (Y.-H.L.), Taipei Medical University, Taipei, Taiwan; School of Nursing (J.A.D., M.B.), University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA; School of Nursing, (M.-L.C.), Chang Gung University, Tao-Yuan, Taiwan; Department of Nursing (L.-Y. T.), Maekay Memorial Hospital, Taipei, Taiwan; and Chang Gung Institute of Nursing, (S.-C.C.), Tao-Yuan, Taiwan

Abstract

The purpose of the study was to develop and preliminarily test the feasibility, validity, reliability, and factor structures of the Pain Opioid Analgesics Beliefs Scale–Cancer (POABS-CA) in hospitalized adults diagnosed with cancer in Taiwan. This scale was developed in three phases. In Phase I, item development was based on qualitative analysis as well as a review of the literature. Face validity, content validity, and feasibility were also evaluated. In Phase II, internal consistency reliability was further tested in 42 subjects with pain. In Phase III, test-retest reliability, internal consistency, and essential construct validity were further assessed in a sample of 361 hospitalized cancer patients with pain. The POABS-CA evolved from testing as a 10-item 5-point Likert-type instrument. Higher scores indicated more negative beliefs regarding opioids and their use in managing pain. Satisfactory face validity and content validity were found. The POABS-CA was also shown to be a reliable and stable pain belief scale, with Cronbach's alpha and test-retest reliability of 0.70 and 0.94, respectively. Two factors, namely pain endurance beliefs and negative effect beliefs, were extracted from the principal component factor analysis to support the construct validity. In conclusion, preliminary evidence indicates the POABS-CA is a reliable, stable, valid and easily applied scale for assessing beliefs regarding opioid use for cancer pain. Further studies should test this scale in different populations to increase its applications in cancer pain management. J Pain Symptom Manage 2003;25:376–385.

Key Words

Cancer pain, pain management, belief, opioids, endurance, instrument development, POABS-CA

Address reprint requests to: Yeur-Hur Lai, RN, PhD, College of Nursing, Taipei Medical University, 250 Wu-Hsing Street, Taipei 110, Taiwan.

Accepted for publication: July 13, 2002.

Introduction

Cancer has been the leading cause of death in Taiwan since 1982. Pain is one of the major problems faced by these cancer patients. More

Published by Elsevier, New York, New York

0885-3924/03/$–see front matter
doi:10.1016/S0885-3924(02)00681-4

than 36% of newly diagnosed Taiwanese cancer patients[1] and 85% of hospice patients[2] have reported pain problems. The high incidence of cancer pain in Taiwan suggests that it is not well controlled. Among the factors influencing effective cancer pain control, misconceptions or negative pain beliefs regarding analgesics, especially opioids, and their use have been identified as the major barriers across various populations, including patients, family caregivers, and health care professionals.[3]

According to cognitive-behavioral pain theory,[4,5] pain beliefs represent a patient's thoughts (cognition) about and appraisal of a pain experience. Empirical studies suggest that selective pain beliefs influence a person's reaction to, coping with, or adjustment to pain.[6–10] Negative beliefs (misconceptions) regarding opioids, the most important analgesics for treating moderate to severe cancer pain, may therefore influence patients' use of, and health care providers' prescription of or administration of these types of medication.

Negative beliefs about opioids and their use, which have commonly been described by the general public, cancer patients, and their family caregivers, include concerns about side effects, addiction, and drug tolerance.[11–20] These beliefs also include the negative implications ascribed to using opioids, such as the connection between their use and end of life.[15, 16, 18, 21]

Despite the availability of professional pain management guidelines,[3, 22] negative beliefs (misconceptions) about opioids are still a major concern of health care providers when dealing with cancer pain.[23] For example, misunderstandings about morphine tolerance[24] and concerns about the side effects of opioids have been found in a study of physicians' attitudes and beliefs about the use of morphine.[25] Similar results have also been found in nurses' attitudes and knowledge regarding cancer pain management[26,27] and in Taiwan among physicians,[28] student nurses[29] and nurses.[30] Misconceptions among health care professionals have led to inappropriate decisions in prescribing or administering opioids. For example, Weiss et al.[31] found that physicians and nurses tended to overestimate the probability of addiction and therefore to delay using opioid analgesics. Dalton[32] found that nurses' pain knowledge and pain beliefs influenced their use of interventions to manage pain in cancer patients.

Social and cultural values or beliefs can also influence a patient's or a care provider's reactions to pain and affect their use of opioids. Pain is more likely to be endured in cultures where stoicism is valued[33] or expression of feelings is not encouraged, such as in Chinese cultures influenced by Confucian thought.[34] Because of these beliefs, Chinese patients avoid taking or lower their dose of pain medication.[33,35] Studies in Hong Kong[36,37] and Taiwan[15] have shown that Chinese cancer patients believe that enduring pain is necessary. Chinese health care providers might also expect patients to endure pain.

Because a team approach, including patients, family caregivers, physicians, nurses, etc., is recognized as the key to successful management of pain, beliefs of all team members regarding opioids can influence pain control outcomes, and should be assessed. Several instruments have been developed to test beliefs, concerns or attitudes about pain, each with its unique strength for various populations. For example, instruments are available to assess patient and family caregiver concerns (barriers) about cancer pain and using analgesics,[14] family caregivers' pain experiences,[38] nurses' knowledge or attitudes related to pain,[39] and physicians' attitudes towards pain.[24] However, the above mentioned instruments have only targeted particular populations. A pain belief scale that can assess negative beliefs about opioids in various populations can be further used to compare differences in beliefs and to identify possible gaps in beliefs about the use of opioids, and therefore to increase the consistency of using opioids. These factors point to the need for an instrument that can be used across different populations.

In addition, most existing pain belief instruments assess misconceptions about analgesics, but do not specifically measure beliefs regarding opioids, which we believe are the major concern of many people in cancer pain management. For example, in Taiwan, the Barrier Questionnaire-Taiwanese version (BQT)[19] has been used to assess patients' and families' concerns about using analgesics. However, this instrument does not specify pain medicines as "opioids," which are a major concern for many patients and family caregivers. Clinical observation indicates that many patients may not object to using nonopioid analgesics, but are re-

luctant to accept opioid treatment for their pain because of misconceptions about opioids. Therefore, a specific assessment of such misconceptions can provide more precise data and lead to more specific and effective pain management interventions. Furthermore, some items on scales developed for assessing patients' or family caregivers' pain beliefs target specific side effects or complications related to analgesics, such as confusion, drowsiness, respiratory suppression, urinary difficulty, and constipation.[20] Inexperienced patients or family caregivers may not know the specific side effects of opioids or analgesics and may have difficulty responding. Also, questions about specific side effects would not be appropriate for pretreatment pain assessment.

Before Phase III of the present study, the first author examined some psychometric characteristics of a brief pain beliefs scale, Pain Opioid Analgesics Beliefs Scale-Cancer (POABS-CA).[40] That study, however, had major limitations; it lacked determinations of test-retest reliability and construct validity, had relatively few subjects, and the POABS-CA subscales[40] had relatively low internal consistency reliability. We therefore designed the present study to provide more comprehensive and precise information about the psychometrics of the POABS-CA.

Our study aims were to (1) develop a brief pain beliefs scale, Pain Opioid Analgesics Beliefs Scale–Cancer (POABS-CA), (2) explore the feasibility, face validity, and content validity of the POABS-CA, and (3) begin to examine the internal consistency reliability, test-retest reliability, and construct validity of the POABS-CA for patients.

Methods and Results

A three-phase psychometric analysis was done to develop and test the reliability and validity of the POABS-CA using convenience sampling. Eligible subjects were hospitalized adult cancer patients recruited from four medical centers in Taipei who (1) knew their diagnoses, (2) had cancer-related pain during the week of the study interview, (3) could verbally express themselves, and (4) agreed to participate in the study. Institutional Review Board approval was obtained for the three phases.

Phase I: Item Generation, Content Validity and Face Validity

The specific aims in Phase I were to develop the POABS-CA items, to examine the face validity of the initial version of the POABS-CA, and to evaluate it by Content Validity Index (CVI).[41] Although existing research has pointed out some concerns (beliefs) about using analgesics, we do not know if culture can influence beliefs about using opioids. Therefore, in addition to reviewing the literature on barriers to pain management, we interviewed Taiwanese patients about opioid use and analyzed their narratives for item development. The qualitative data provided a better understanding of these patients' beliefs about opioids. These data were also used to validate the appropriateness of using the existing literature to formulate the POABS-CA items.

One open-ended question, preceded by an explanation of terms, was asked of 10 eligible patients: "Opioid analgesics are one of the commonly used pain medicines in cancer patients. Opioid analgesics are also called narcotic analgesics; an example is morphine-like pain medicine. What are your thoughts or beliefs about opioid analgesics used in cancer pain?" Because most patients were reluctant to have their interviews tape-recorded, two oncology nurses interviewed subjects together so that one could write down responses as the patient spoke. The data were then independently analyzed by two master's-prepared nurses trained in content analysis. The average congruency rate was 88%. Two themes were found in the data: beliefs about "negative effects of opioids" and "enduring pain." We defined the negative effects of opioids as negative thoughts regarding opioids and connecting opioids to a negative disease outcome.

The qualitative content found in the patients' comments on "negative effect of opioids" was basically similar to the existing literature on barriers to pain management;[2] the use of opioids was believed to have negative effects on the body or opioid use was linked to negative disease outcome. The second theme, "pain endurance" was particularly evident as an important pain belief for nine of the ten patients. Some patients even mentioned that their nurses or physicians had suggested that they endure pain for various reasons. Although the current study did not directly examine this issue among

health care providers, the patients' narrative data imply that some health care professionals may have pain endurance beliefs and expect patients to endure pain. Pain endurance beliefs in both Chinese health care professionals and patients might reflect a cultural belief influenced by Confucian thought, which does not value expressing physical or emotional distress to other.[34] Existing instruments, however, put relatively little emphasis on directly measuring belief about pain endurance.

Based on the qualitative findings and the existing literature, we used these two themes to frame the POABS-CA with two major belief subscales: (1) negative effect beliefs and (2) pain endurance beliefs. Negative effect beliefs are beliefs that using opioids for cancer pain can impair one's health and/or implies a negative health outcome. Pain endurance beliefs are beliefs that one should tolerate as much pain as possible. Based on these two themes, 14 items were developed by three clinically experienced master's-prepared oncology nurses. All items in the POABS-CA were developed using negative phraseology because this phrasing resembled how people usually described their beliefs about opioids.

The original POABS-CA was a 14-item, 5-point Likert-type scale ranging from 0 ("strongly disagree") to 4 ("strongly agree"). The higher the score, the more negative the belief about using opioid analgesics for cancer pain, and the stronger the belief that pain should be endured. Content Validity Index (CVI)[41] was used by seven pain management experts (two oncologists, two anesthesiologists, and three master's-prepared oncology nurses) to examine content relevance and clarity of wording. The CVI ranged from 86% to 100%.

Face validity of the POABS-CA was examined by another ten eligible subjects. To increase the readability of the scale and make it appropriate for a variety of populations including patients, family members, and health care providers, the term "opioid" was defined in the tool instructions as "opioids (or opioid medicines) are also called narcotics by some people." Face validity was supported by the subjects' confirmation that the POABS-CA reflected their beliefs about opioid analgesics for cancer pain. Based on the suggestions of five of the ten patients, two redundant items were deleted. Twelve items were kept at the end of Phase I.

Phase II: Pilot Test of the Feasibility and Reliability of the POABS-CA

Pilot data were collected using a convenience sample of 42 cancer patients recruited from one oncology inpatient ward of a large medical center in Taipei. Pain beliefs were measured by the POABS-CA and a demographic data form. Pain intensity was assessed using a 0 ("no pain") to 10 ("pain as bad as it could possibly be") numerical rating scale. Feasibility of the POABS-CA was assessed by calculating the time subjects took to complete the scale.

The patients took only 3 to 8 minutes to complete the scale, and mentioned that they found the POABS-CA to be easily understood, with clear wording and easy to answer questions. Cronbach's alpha for the POABS-CA was 0.85, which meets the suggested criterion (alpha > 0.70) for adequate internal consistency reliability.[41] The results of "item to total correlation" met the 0.30 criterion,[42] except for one item ("Pain is an inevitable symptom of cancer"), which was dropped. Eleven items were kept at the end of Phase II.

Phase III: Reliability and Construct Validity

The specific aims in Phase III were to (1) test the internal consistency reliability and test-retest reliability, (2) preliminarily examine the construct validity by using factor analysis, Pearson's correlation and t-test.

Factor analysis was used to examine the consistency of the proposed beliefs subscales and factors extracted from the current study. Pearson's r was calculated to analyze the relationship among these two beliefs, and criterion-related variables, including age, years of formal education, gender, and pain intensity. These criterion variables were selected because they showed relatively consistent empirical findings supporting their relationship to pain beliefs.

Previous research suggested that older and less educated patients[14,43] or family caregivers[19,20] tended to have more concerns (misconceptions) about pain medicine. These people are also likely to endure pain.[44] Research also suggests that gender might influence patients' beliefs about analgesics. For example, Ward et al.[43] found that female patients were more concerned about side effects of analgesics than male patients. From our clinical observations in Taiwan, male patients tend to endure or not

Table 1
Demographic and Disease Characteristics of Patients (n = 361)

Characteristics	Mean (SD)	n	Percent
Age (years)	52.6 (14.4)		
Education			
Illiterate		28	8
Elementary school		98	27
High school		132	37
College or graduate school		103	28
Gender			
Male		201	56
Female		160	44
Diagnosis			
Lung cancer		85	24
Primary liver cancer		49	14
Breast cancer		44	12
Gastric cancer		25	7
Colorectal cancer		22	6
Nasopharyngeal cancer		21	6
Esophageal cancer		18	5
Head and neck cancer		17	5
Cervical cancer		16	4
Lymphoma		15	4
Sarcoma		11	3
Others		38	10

to express pain more than female patients. Studies have also suggested that patients with more concerns (misconceptions) about analgesics have higher pain intensity than those who do not.[14,19,43] Persons with more pain endurance beliefs are assumed to have higher pain intensity because they have more pain.

A total of 361 patients were recruited by purposive sampling from the cancer inpatient wards at five medical centers in Taiwan. The subjects' age, education level, and cancer diagnoses (Table 1) generally reflected the national picture of the Taiwanese cancer population, except for gender. A slightly higher percent of males was involved because one data collection site was a veterans' hospital. The average pain intensity was 3.92 (SD = 2.07) and the worst pain intensity was 7.07 (SD = 2.40).

Reliability of the POABS-CA Total Scale

All item to total correlations of the 11-item POABS-CA were above 0.30, except for "Cancer pain can not be completely relieved" (r = 0.18) and "An adult should endure as much pain as possible" (r = 0.23). The former was deleted but the latter was kept because of its clinical usefulness, and the POABS-CA became a 10-item instrument.

The POABS-CA is shown in Table 2. Cronbach's alpha for the 10-item POABS-CA was recalculated as 0.70 (Table 3). Although two items still had item to total correlations of only 0.20 to 30, all 10 items were retained because of their clinical usefulness in assessing pain beliefs about opioid and endurance.

Preliminary Construct Validity and Subscale Reliability

Principal component analysis with oblique rotation was performed to examine the factor structures of the POABS-CA. Criteria used to select factors included (1) eigenvalue of one

Table 2
Pain Opioid Analgesics Belief Scale–Cancer (POABS-CA)

In the following 10 statements, we ask for your beliefs about the use of opioids in cancer pain. Opioids or opioid medicines are also called narcotics by some people. Please circle the number that best shows your belief about opioid medicine and its use.

0 = I strongly disagree.
1 = I disagree.
2 = I neither agree nor disagree.
3 = I agree.
4 = I strongly agree.

1. Opioid medicine is not good for a person's body.	0	1	2	3	4
2. Opioid medicine should only be used at the last stage of an illness.	0	1	2	3	4
3. If a person starts to use opioid medicine, it means health is already in serious condition.	0	1	2	3	4
4. Opioid medicines cause many side effects.	0	1	2	3	4
5. Side effects caused by opioid medicine are not easy to handle.	0	1	2	3	4
6. Adults should not ask frequently for pain medicine.	0	1	2	3	4
7. Adult patients should not use opioid medicine frequently.	0	1	2	3	4
8. The more opioid medicine a person uses, the greater the possibility that he or she might rely on the medicine forever.	0	1	2	3	4
9. If a person starts to use opioid medicine at too early a stage, the medicine will have less of an effect later.	0	1	2	3	4
10. An adult should endure as much pain as possible.	0	1	2	3	4

Table 3
Mean Item Scores and Item to Total Correlations for the POABS-CA (n = 361)

Items	Mean	SD	Item to total Correlation
1. Opioid medicine is not good for a person's body.	2.86	0.63	0.28
2. Opioid medicine should only be used at the last stage of an illness.	2.21	0.90	0.39
3. If a person starts to use opioid medicine, it means health is already in serious condition.	2.40	0.83	0.37
4. Opioid medicines cause many side effects.	2.66	0.65	0.37
5. Side effects caused by opioid medicine are not easy to handle.	2.32	0.67	0.41
6. Adults should not ask frequently for pain medicine.	2.44	0.94	0.35
7. Adult patients should not use opioid medicine frequently.	2.60	0.86	0.44
8. The more opioid medicine a person uses, the greater the possibility that he or she might rely on the medicine forever.	2.68	0.73	0.41
9. If a person starts to use opioid medicine at too early a stage, the medicine will have less of an effect later.	2.68	0.62	0.35
10. An adult should endure as much pain as possible.	2.33	1.03	0.23

Note. Theoretical Scoring Range: 0–4, the higher the score, the more negative the belief.

or above and (2) factor loading greater than 0.30.[45] The POABS-CA indicated a two-factor structure, which supported the original two-subscale design (Table 4). These two factors could be differentiated by their loading of each item, but with a moderate level of correlation (r = 0.23). Factor 1 represented negative effect beliefs and included seven items that reflect and fit the original item arrangement. Factor 2 included three items and also supported the original arrangement of these items under the "pain endurance belief" factor. Factor 1 explained 18.7% of the variance, and factor 2 explained 16.4%, accounting for 35.1% of the total variance.

Pearson's product moment correlation was calculated among the POABS-CA subscales and criterion variables of age, years of education, and pain intensity (Table 5). Gender differences in these beliefs were analyzed by *t*-test. Age and education were not significantly correlated to negative effect beliefs. No gender difference was found in negative effect beliefs. Patients with higher negative effect beliefs had higher pain intensity on average (r = 0.14, $P < 0.01$). As expected, older and less educated persons had higher pain endurance beliefs, with r = 0.26 ($P < 0.0001$) and −0.23 ($P < 0.0001$), respectively. Male patients believed more in the value of enduring pain (Mean = 2.57, SD = 0.77) than females (Mean = 2.32, SD = 0.57)(t = −3.08, df = 359, $P < 0.005$). Least pain intensity was correlated to patients' pain endurance beliefs (r = 0.10, $P < 0.05$).

The internal consistency reliabilities for the POABS-CA overall, its negative effect beliefs

Table 4
Two-Factor Solution with Oblique Rotation of the POABS-CA (n = 361)

Subscale	Item	Factor Loading	
		Factor 1	Factor 2
Negative[a]	5. Side effects caused by opioid medicine are not easy to handle	0.61	−0.01
Negative	4. Opioid medicines cause many side effects.	0.58	−0.09
Negative	2. Opioid medicine should only be used at last stage of an illness.	0.53	0.02
Negative	8. The more opioid medicine a person uses, the greater the possibility that he or she might rely on the medicine forever.	0.52	0.10
Negative	3. If a person starts to use opioid medicine, it means health is already in serious condition.	0.52	−0.02
Negative	9. If a person starts to use opioid medicine at too early a stage, the medicine will have less of an effect later.	0.52	0.04
Negative	1. Opioid medicine is not good for a person's body.	0.50	0.03
Endure[b]	6. Adults should not ask frequently for pain medicine.	−0.05	0.81
Endure	7. Adult patients should not use opioid medicine frequently.	0.05	0.80
Endure	10. An adult should endure as much pain as possible.	−0.03	0.48

[a] Negative effect belief.
[b] Pain endurance belief.

Table 5
Bivariate Correlations Among POABS-CA Subscales, Age, Education and Pain Intensity (n = 361)

Variables	Age	Education	Pain Intensity on Average	Worst Pain Intensity	Least Pain Intensity
Negative Effect Belief	−0.08	0.01	0.14[a]	−0.02	0.07
Pain Endurance Belief	0.26[b]	−0.23[b]	−0.01	−0.09	0.10[c]

[a] $P < 0.001$.
[b] $P < 0.0001$.
[c] $P < 0.005$.

subscale, and pain endurance beliefs subscale were 0.70, 0.70, and 0.75, respectively. A test-retest reliability over a 3-day interval was measured, but only 101 of the 361 subjects (30%) completed the retest. Some subjects had been discharged from the hospital before the retest (41%); some did not participate in the retest because they were too ill or had lost consciousness (17%); some family members insisted that patients needed more rest rather than another test (7%), and 18 patients died (5%). Test-retest reliability was 0.94.

To better understand patients' beliefs about the negative effects of opioids and pain endurance, the mean score of each belief item and its percentage distribution for the level of agreement (0 = "I strongly disagree" to 4 = "I strongly agree"; higher agreement indicates more misconceptions) were analyzed and listed in Tables 3 and 6, respectively. We used the mean, instead of a summated score, to indicate a person's pain belief because each POABS-CA item represents an important pain belief regarding opioids and pain endurance, and can indicate a person's particular misconceptions about opioids. The range of means was from 2.21 (SD = 0.96) to 2.86 (SD = 0.63). The distribution of levels of agreement (and disagreement) for each belief item revealed that 8 out of the 10 items were rated 3 ("I agree") or 4 ("I strongly agree") by more than 50% of patients. This finding suggests that a majority of patients had negative beliefs about opioids and their related effects, and also tended to endure pain.

Discussion

In our preliminary psychometric analysis, the POABS-CA was found to be a clinically useful assessment scale with scientific merit. Cronbach's alphas for the POABS-CA and its two subscales support its overall satisfactory internal consistency reliability, especially since it only contains 10 items.[46,47] The satisfactory test-retest reliability (r = 0.94) in Phase III further supports the POABS-CA as stable.

Regarding the negatively worded items of the POABS-CA, we recognize that this type of item could bias responses.[48,49] However, the wording of items in the POABS-CA is based on how patients usually described their use of opioids. The closer the wording to a person's com-

Table 6
Frequency Distribution for Level of Agreement with Each Pain Belief

Belief Items	Level of Agreement (%)				
	0	1	2	3	4
1. Opioid medicine is not good for a person's body.	0.3	3.0	16.9	69.8	10.0
2. Opioid medicine should only be used at the last stage of an illness.	1.4	22.4	35.2	35.5	5.5
3. If a person starts to use opioid medicine, it means health is already in serious condition.	0.6	15.5	32.4	46.5	5.0
4. Opioid medicines cause many side effects.	0.3	4.7	28.3	62.3	4.4
5. Side effects caused by opioid medicine are not easy to handle.	—	9.2	52.6	35.7	2.5
6. Adults should not ask frequently for pain medicine.	0.8	23.8	10.6	59.8	5.0
7. Adult patients should not use opioid medicine frequently.	0.3	16.6	13.0	62.6	7.5
8. The more opioid medicine a person uses, the greater the possibility that he or she might rely on the medicine forever.	0.6	6.9	23.5	61.5	7.5
9. If a person starts to use opioid medicine at too early a stage, the medicine will have less of an effect later.	0.3	2.2	31.9	60.1	5.5
10. An adult should endure as much pain as possible.	2.8	26.3	13.9	49.0	8.0

Note. 0 = I strongly disagree, 1 = I disagree, 2 = I neither agree nor disagree, 3 = I agree, 4 = I strongly agree.

mon usage, the easier for him or her to answer. A tool with both positive and negative wording could be confusing[48] and difficult to answer for some cancer patients, particularly those who are very ill. To balance problems of acquiescence and confusion,[48] negatively worded items were kept in the POABS-CA, and patients found the POABS-CA to be an easily understood and answered pain measure.

This instrument's 10 items focus on beliefs about opioid analgesics and their use in the treatment of cancer pain. The two dropped items in Phases II and III, "Pain is an inevitable symptom of cancer" (dropped in Phase II) and "Cancer pain can't be completely relieved" (dropped in Phase III), might measure different constructs of cancer pain. In the first author's previous study,[40] these two items formulated a third subscale, namely "nature of cancer pain." Since these two items did not have sufficient factor loading and also did not fit the current study's construct of measuring beliefs about opioids, we did not include them in the final version of the POABS-CA. Although the two items were dropped, they have clinical importance in reflecting patients' misperceptions that cancer pain is inevitable. Because these items (beliefs) could potentially influence patients' expectations about cancer pain control, they might be recorded as two separate items to assess patients' beliefs directly related to the nature of cancer pain.

The results of principal component analysis with promax oblique rotation supported the two-factor structure, which met our original formulation of this scale. Items from the two subscales (negative effective beliefs and pain endurance beliefs) all loaded on their original arranged subscales. Regarding the preliminary constructive validity for pain endurance beliefs, most of the assumed relationships among pain endurance beliefs and age, education, gender, and pain intensity were supported. However, there was no significant correlation between negative effect beliefs and age, education, and gender, except pain intensity on average. These findings suggest that beliefs about the negative effects of opioids might be a universal phenomenon across patients with different demographic characteristics. Indeed, the relationships among negative effect beliefs and demographic characteristics are still under investigation, since relatively few published studies have examined them. The reported relationships among these variables have been inconsistent. For example, Hsieh et al.'s study[50] of Taiwanese cancer patients found that younger patients tend to have more misconceptions (concerns) about analgesics, which is contrary to the findings of Ward[14,43] and Lin.[19] Future research is needed to verify these relationships.

The mean scores of each item on the two subscales, and the distribution of level of agreement with each belief suggest that the majority of cancer patients with pain still have misconceptions about opioids and their effects on disease outcome, and also believe that enduring pain is necessary. These observations may partially explain why patients in this study had high worst pain intensity.

Despite the satisfying results of this preliminary examination of the reliability and validity of POABS-CA, the study has several limitations. Though the test-retest coefficient was .94, only 30% of our subjects completed the retest. Given the short hospital stays because of insurance limitations, future studies should apply the POABS-CA soon after patient admission to increase accessibility to patients for retest. Examination of concurrent validity in the present study was limited. Further testing of the concurrent validity of POABS-CA is needed to analyze its relationship to other pain beliefs or pain experience scales, for example, the Barrier Questionnaire[14] or Family Pain Questionnaire[38] for patients or family members, and the nurses' pain attitudes scale[39] for nurse populations. Finally, we tested the POABS-CA only in a patient population. Given our overall goal of developing and using the POABS-CA for patients, family members, health care professionals, and the general public, further validation of this scale in these populations is urgently needed.

A beginning effort was made to validate the POABS-CA as a reliable pain belief scale in a Taiwanese cancer patient population. This clinically useful tool only takes a few minutes to complete and is easily understood, making it ideal for clinical pain assessment or evaluation of changes commonly found in the two pain beliefs before and after pain education. Scores on the separated subscales can be further used to identify different types of patients' misconceptions, which will facilitate more individualized pain management and counseling. Although we tested the POABS-CA in only a patient pop-

ulation, further testing across various populations (family, nurses, physicians) would validate and enhance its psychometric properties, thus increasing its usefulness for future clinical assessment and research purposes.

Acknowledgments

This study was partly supported by a grant from the National Science Council in Taiwan (NSC88-2314B-034-10). The authors gratefully acknowledge the support and assistance of the patients who participated in this study, and the medical and nursing staff of the oncology wards at National Taiwan University Hospital and Makay Memorial Hospital. The authors also thank Beverly Henry for her careful review of this manuscript and Claire Baldwin for her English editing.

References

1. Ger LP, Ho ST, Wang JJ, Cherng CH. The prevalence and severity of cancer pain: A study of newly-diagnosed cancer patients in Taiwan. J Pain Symptom Manage 1998;15:285–293.

2. Chiu TY. Pain control interminal cancer patients. Formosan J Med 1997;1:198–208.

3. U. S. Department of Health and Human Services. Management of cancer pain. Quick Reference Guide for Clinicians, No. 9. AHCPR Publication No. 94-0592. Rockville, MD. Agency for Health Care Policy and Research, U.S. Department of Health and Human Services, 1994.

4. Turk DC, Meichenbaum D, Genest M. Pain and behavioral medicine: A cognitive-behavioral perspective. New York: Guilford Press, 1983.

5. Jensen MP, Turner JA, Romano JM, Karoly P. Coping with chronic pain: A critical review of the literature. Pain 1991;47:249–283.

6. Arathuzik MD. The appraisal of pain and coping in cancer patients. Western J Nurs Res 1991;13: 714–731.

7. Williams DA, Keefe FJ. Pain beliefs and the use of cognitive-behavioral coping strategies. Pain 1991; 46:185–190.

8. Lai YH. The use of cognitive-behavioral pain coping in Taiwanese cancer patients. Unpublished Doctoral Dissertation, The University of North Carolina at Chapel Hill; 1996.

9. Jensen MP, Turner JA, Romano JM, Lawler BK. Relationship of pain-specific beliefs to chronic pain adjustment. Pain 1994;57:301–309.

10. Jensen MP, Romano JM, Turner JA, et al. Patient beliefs predict patient functioning: further support for a cognitive-behavioral model of chronic pain. Pain 1999;81:95–104.

11. Cleeland CS. Pain control: Public and physicians' attitudes. In: Hill Jr. CS, Field WS, eds. Issues in pain measurement. Advances in pain research and therapy, Vol. 12. New York: Raven Press, 1989: 81–89.

12. Hodes RL. Cancer patients need and concerns when using opioid analgesics. In Hill Jr CS, Field W, eds. Drug treatment of cancer pain in a drug-oriented society. Advances in pain research and therapy, Vo1. 11. New York: Raven Press, 1989:91–99.

13. Dar R, Beach CM, Barden PL, Cleeland CS. Cancer pain in the marital system: A study of patients and their spouses. J Pain Symptom Manage 1992;7:87–93.

14. Ward SE, Goldberg N, Miller-McCauley V, et al. Patients-related barriers to management of cancer pain. Pain 1993;52:319–324.

15. Lin CC, Ward SE. Patient-related barriers to cancer pain management in Taiwan. Cancer Nurs 1995;18:16–22.

16. Riddell A, Fitch MI. Patients' knowledge of and attitudes toward the management of cancer pain. Oncol Nurs Forum 1997;24:1775–1784.

17. Paice JA, Toy C, Shott S. Barriers to cancer pain relief: Fear of tolerance and addiction. J Pain Symptom Manage 1998;16:1–9.

18. Wills BSH, Wootton YSY. Concerns and misconceptions about pain among Hong Kong Chinese cancer patients with pain. Cancer Nurs 1999;22:408–413.

19. Lin CC. Barriers to the analgesic management of cancer pain: a comparison of attitudes of Taiwanese patients and their family caregivers. Pain 2000; 88:7–14.

20. Lin CC, Wang P, Lai YL, et al. Identifying attitudinal barriers to family management of cancer pain in palliative care in Taiwan. Palliat Med 2000;14: 463–470.

21. Levin DN, Cleeland CS, Dar R. Public attitudes toward cancer pain. Cancer 1985;56:2337–2339.

22. World Health Organization. Cancer pain relief and palliative care. Report of a WHO expert committee, World Health Organization Technical Report Series, 804. Geneva, Switzerland: World Health Organization 1990:1–75.

23. Weissman DE, Dahl JL. Attitudes about cancer pain: A survey of Wisconsin's first-year medical students. J Pain Symptom Manage 1990;5:345–349.

24. Elliott TE, Elliott BA. Physician attitudes and beliefs about use of morphine for cancer pain. J Pain Symptom Manage 1992;7:141–148.

25. Elliott TE, Murray DM, Elliott BA, et al. Physician knowledge and attitudes about cancer pain management: a survey from the Minnesota cancer pain project. J Pain Symptom Manage 1995;10:494–504.

26. McCaffery M, Ferrell BR, O'Neil-Page E, Lester M. Nurses' knowledge of opioid analgesic drugs and psychological dependence. Cancer Nurs 1990;7: 149–155.

27. McCaffery M. Ferrell BR. Nurses' knowledge about cancer pain: a survey of five countries. J Pain Symptom Manage 1995;10:356–369.

28. Ger LP, Ho ST, Wang JJ. Physicians' knowledge and attitudes toward the use of analgesics for cancer pain management: A survey of two medical centers in Taiwan. J Pain Symptom Manage 2000;20:335–44.

29. Lai YH, Chen SH, Chang LY, et al. Students nurses' knowledge about pain and beliefs about opioid analgesics and related factors. New Taipei J Nurs 2000;2:5–15.

30. Hsiu LN, Chang YP, Chen SC, Lai YH. Beliefs about cancer pain and opioid analgesics and related factors among nurses. Chang Gung Nursing 2001; 12:200–207.

31. Weis OF, Sriwatanakul K, Alloza JL, et al. Attitudes of patients, house staff and nurses toward postoperative analgesic care. Anesth Analg 1983;62:70–74.

32. Dalton JA. Changing the relationship among nurses' knowledge, self-reported behavior, and documented behavior in pain management: Does education make a difference? J Pain Symptom Manage 1996;12:308–319.

33. Juarez G, Ferrell B, Borneman T. Influence of culture on cancer pain management in Hispanic patients. Cancer Pract 1998;6:262–269.

34. Lin TY. Psychiatry and Chinese culture. West J Med 1983;139:862-867.

35. Streltzer J, Wade TC. The influence of cultural group on the undertreatment of postoperative pain. Psychosom Med 1981;43:397–403.

36. Chung TK, French P, Chan S. Patient-related barriers to cancer pain management in a palliative care setting in Hong Kong. Cancer Nurs 1999;22: 196–203.

37. Chung JWY, Wong TKS, Yang JCS. The lens model: Assessment of cancer pain in a Chinese context. Cancer Nurs 2000;23:454–461.

38. Ferrell B, Rhiner M, Rivera LM. Development and evaluation of the Family Pain Questionnaire. J Psychosocial Oncology 1993;10(4):21–35.

39. Ferrell BR, Leek C. Written communication, 1990.

40. Lai YH. Beliefs about cancer pain and opioid analgesics: Scale development and current status (In Chinese). J Nurs Res, Taiwan Nurses Assoc 2000:8, 557–567.

41. Polit DF, Hungler BP. Nursing Research: Principles and methods, 6th. ed. Philadelphia: JB Lippincott, 1999.

42. Kerlinger FN. Foundation of behavioral research. New York: Springer, 1973.

43. Ward SE, Carlson-Dakes K, Hughes SH, et al. The impact on quality of life of patient-related barriers to pain management. Res Nurs Health 1998;21: 405–413.

44. Vargas CM, Macek MD, Marcus SE. Sociodemographic correlates of tool pain among adults: United States, 1989. Pain 2000;85:87–92.

45. Rummel RJ. Applied factor analysis. Evanston: Northwestern University Press, 1970.

46. Carmines EG, Zeller RA. Reliability and validity assessment. Newbury Park: Sage, 1979.

47. Nunnally J. Psychometric Theory, 2nd. ed. New York: McGraw-Hill, 1978.

48. Devellis RF. Scale development: Theory and applications. Applied social research methods series, Vol. 26. Newbury Park: Sage, 1991.

49. Waltz CF, Strickland OL, Lenz ER. Measurement in nursing research (2nd Ed.). Philadelphia: FA Davis Co, 1991.

50. Hsieh LF, Lin CC, Lai YH, Tsou TS. The relationship of the caregiver's concerns about using analgesics to the patient's cancer pain management (In Chinese). J Nurs Res, Taiwan Nurses Assoc 1998; 6:327–337.