

Attitudes towards pain management in hospitalized cancer patients and their influencing factors

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Abstract

Objective: To investigate patients' attitudes towards cancer pain management and analyze the factors influencing these attitudes.

Methods: The self-developed Demographic and Disease-Related Information Questionnaires, Pain Management Barriers Questionnaire-Taiwan form (BQT), and Pain Knowledge Questionnaire were administered to 363 pairs of hospitalized cancer patients and their caregivers from the oncology departments of 7 hospitals in Beijing, China.

Results: The average patient score for attitudes towards pain management was 2.96 ± 0.49 . The dimension scores indicated good attitudes in three areas (scores < 2.5), "Desire to be good" (2.22 ± 1.04), "Fatalism" (2.08 ± 0.81) and "Religious fatalism" (1.86 ± 1.00), and poor attitudes in six areas (scores ≥ 2.5), "Tolerance" (3.83 ± 0.96), "Use of analgesics as needed (*p.r.n.*)" (3.73 ± 1.01), "Addiction" (3.44 ± 1.05), "Disease progression" (3.28 ± 1.26), "Distraction of physicians" (3.16 ± 1.07) and "Side effects" (2.99 ± 0.68). Two factors were entered into the regression equation: the caregivers' attitudes towards cancer pain management and the patients' pain knowledge. These two factors explained 23.2% of the total variance in the patients' average scores for their attitudes towards cancer pain management.

Conclusions: The patients' attitudes towards cancer pain management were poor and could be influenced by the caregivers' attitudes and the patients' pain knowledge, and thus need to be improved.

Keywords: Cancer patients; cancer pain; attitudes towards cancer pain management

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Introduction

Cancer is one of the major chronic diseases in China and around the world. The estimated new cancer cases and deaths were 3.59 million and 2.19 million in 2012 in China, respectively (1). Cancer pain is defined as pain caused by primary or metastatic tumors, diagnostic or therapeutic process, or psychological factors (2). More than one third of cancer patients had moderate and severe pain, and 64%–75% of patients with pain were in advanced stage (3). Cancer pain seriously impacts patients' quality of life, and along with anxiety, depression and psychological disorders, and it is a primary reason for shortened life expectancy

(4,5). Research indicated that 31%–65% of cancer pain cases are not controlled effectively (6). In 90% of cancer patients, pain could be alleviated by effective pain management (7). Pain management is defined as the process of reducing or controlling pain via health professional services, including pain assessment, pain treatment, health education, and psychological care (8,9). It requires patients to report their pain and take analgesics according to a doctor's advices. Patients' degree of adherence to pain reporting and analgesic use will determine the effects of pain management efforts. However, research findings indicated that cancer patients' adherence to pain management regimens is poor. It was

showed that only 12.74% of cancer patients took the initiative to report pain, and 24% deliberately concealed their pain situation by concealing their medical history of pain or reporting an inappropriately low pain grade (10). Only 61.75% of cancer patients took analgesics on schedule according to doctors' advices (11). Studies indicated that cancer patients' adherence to pain management regimens depended on their attitudes towards cancer pain management (12). The Agency for Health Care Policy and Research (AHCPR) of America published the Clinical Practice Guideline for Cancer Pain Management, which indicated that cancer patients' concerns about pain management, such as addiction to analgesics and side effects of analgesics, can discourage patients from reporting their pain or taking analgesics and can constitute patient-related barriers to cancer pain management (13,14). The Barriers Questionnaire (BQ) can be used to measure attitudes towards cancer pain management and determine the barriers that they present. Generally high average scores indicate that the respondents' general attitude towards pain management is poor, which is likely to create barriers to pain management. Patients' attitudes towards pain management, comprising quantitative variables, will affect their tendency to accurately report the pain they are experiencing and to take analgesics, thus influencing the extent to which their pain can be relieved (15-17). Cancer patients' attitudes towards pain management can be affected by personal factors, such as the patients' pain knowledge and demographic and sociological characteristics (14,18), and by the attitudes of the caregivers around them (19). Several studies delivered interventions to cancer patients and their caregivers simultaneously and found that as a result, the attitudes of the patients and their caregivers towards pain management were improved, the patients' pain intensity was lowered, and their adherence to taking prescription analgesics was enhanced (20,21).

At present, studies of cancer patients' attitudes towards pain management focused on describing the current situation and determining the importance of attitudes towards pain management. Little research has examined the factors influencing cancer patients' attitudes towards pain management and even less has focused on caregivers' influence on these attitudes. Thus, it is necessary to investigate cancer patients' attitudes towards pain management in China and analyze the factors that influence these attitudes, particularly caregivers' influence on patients' attitudes. This study could help health professionals improve patients' attitudes towards cancer

pain management by undertaking effective measures, effectively enhance patients' willingness to accurately report their pain and take analgesics, control patients' pain, and improve patients' quality of life.

Materials and methods

Participants and settings

This descriptive, cross-sectional study obtained data via questionnaire administered to a convenience sample of 363 pairs of hospitalized patients and their caregivers selected from the oncology departments of 7 hospitals in Beijing, China from January to March of 2015. All of the respondents were willing to participate in this study and provided their written informed consent. The study was approved by the Institution Review Board of Peking University (PU IRB).

For the patients, the inclusion criteria were as follows: 1) a cancer diagnosis at least one month before the study; 2) awareness of their disease diagnosis; 3) experiencing cancer-related pain and currently taking oral analgesics at home or according to doctors' advice, such as non-steroid anti-inflammatory drug, weak opioid analgesics, or strong opioid analgesics; 4) the ability to read and understand the questionnaires; and 5) aged 18 years or older. The exclusion criteria were as follows: 1) surgery patients; or 2) an inability to complete the questionnaire survey because of illness or treatment.

For the caregivers, the inclusion criteria were as follows: 1) identified by the patient as the individual most involved in his/her care; 2) have cared for the patient for one month or longer; 3) the ability to read and understand the questionnaires; and 4) aged 18 years or older. The exclusion criterion was the inability to complete the questionnaire survey because of sudden sick or other reasons.

According to the advices of Bentler & Chou, at least 5 samples are needed for every observing variable (22). As the item numbers of instruments for patients or caregivers in this research were about 40 respectively, the sample sizes of patients or caregivers were about 400 respectively, which can meet the needs of this study.

Instruments

Demographic and Disease-Related Information Questionnaires

These questionnaires, which were designed by researchers,

were used to investigate the sociodemographic data for the pairs of respondents and the disease-related information of the patients. The patients' sociodemographic data included gender, age, education, marital status, career, their family's average monthly income, and hospital payment pattern. The disease-related information included the disease diagnosis, metastasis status, and the surgery, chemotherapy and radiotherapy history. The caregivers' sociodemographic data included gender, age, education, career, relationship with the patient, and duration of caring for the patient.

Pain Management Barriers Questionnaire-Taiwan Form (BQT)

The BQT was used to measure attitudes towards pain management that represent barriers to pain reporting and analgesic use among cancer patients and their caregivers. The BQ was developed by Ward *et al.* in 1993, and was translated into Chinese and revised by Lin and Ward in 1995 to create the BQT. The BQT includes 9 dimensions and 34 items: Addiction (3 items), Disease progression (3 items), Tolerance (if one person takes analgesics when he or she has some pain, it might not work as well if the pain becomes worse, 3 items), Fatalism (analgesics cannot effectively control cancer pain, 3 items), Religious fatalism (cancer pain is predestined, 3 items), Use of analgesics as needed (*p.r.n.*) (3 items), Side effects (10 items), Distraction of physicians (3 items), and Desire to be good (3 items). For each item of the BQT, patients use a 1 to 5 point scale to rate the extent to which they agree (1 = do not agree at all; 5 = agree very much). Item 23 and item 24 are reversely coded. The total score of the BQT is the average score for the 34 items, and the dimension score is the average score of all of the items within a given dimension. Both the total score and dimension score range from 1 to 5 points. The BQT was used with cancer patients of Taiwan, China by Lin and Ward in 1995, and the Cronbach's alpha was 0.78 (23). The cancer pain management attitudes of cancer patients in Taiwan, China and their caregivers were measured by Lin in 2000, and the Cronbach's alphas were 0.85 and 0.87, respectively (24). In a trial test for the present study, the Cronbach's alphas for the pain management attitudes of cancer patients and their caregivers were 0.799 and 0.808, respectively. Higher total average scores indicated worse general attitudes towards cancer pain management and greater barriers to pain management. This study obtained the approval to use the BQT from Lin.

Pain Knowledge Questionnaire

The Family Pain Questionnaire (FPQ), developed by Ferrell in 1993, was used to measure the pain knowledge of cancer patients and their caregivers. This questionnaire had been tested by Ferrell in 1993 for content validity (content validity index >0.90) and test/retest reliability ($r > 0.80$), and the internal consistency analysis produced a Cronbach's alpha of 0.81. Scholars in China translated the part of pain knowledge of FPQ into Chinese with the test-retest reliability of 0.65, content validity of 0.95 and Cronbach's alpha of 0.74. The tool consists of 10 items related to addiction, frequency of use, scheduling and the adverse effects of analgesics. The score for each item indicates the accuracy of the participant's knowledge: correct answers receive 10 points, and incorrect answers receive 0 points (25,26). The pain knowledge of cancer patients and caregivers was assessed using the knowledge subscale of the FPQ by Aubin *et al.* (27) and Berit *et al.* (28), and the test-retest reliability was 0.80. In the trial test for the present study, the Cronbach's alphas for measuring the pain knowledge of cancer patients and their caregivers were 0.544 and 0.605, respectively. Higher average scores for pain knowledge indicated that the participants had higher levels of pain knowledge.

Data collection and quality control

Approval for this study was obtained from the Biomedical Ethics Committee of Peking University. The patients and caregivers who met the selection criteria were approached individually by the researchers, who described the study and obtained informed consent from both the patients and their caregivers. The patients completed the BQT, Pain Knowledge Questionnaire, and Demographic and Disease-Related Information Questionnaires (patient section). The caregivers completed the BQT, Pain Knowledge Questionnaire, and Demographic Questionnaire (caregiver section). The researchers used the same instructions to explain the study methods and instructions for completing the questionnaires to all of the participants. All the information was self-reported by the patients and their caregivers independently. The questionnaires were administered and returned in the same session. Participant questionnaires missing less than 10% of the items on the Demographic and Disease-Related Information Questionnaire and no missing items on the BQT and FPQ were considered valid.

Each questionnaire included a patient section and a

caregiver section, which were used to investigate the patient and caregiver pair. A total of 400 questionnaires were administered and returned during the investigation, of which, 363 were considered valid (the valid return rate was 90.75%).

Statistical analysis

All of the measurement data and count data were collected, organized, and entered into a Microsoft Excel 2010 (Redmond, WA, USA) spread sheet. The analyses were conducted using IBM SPSS Statistics (Version 22.0; IBM Corp., New York, USA). Statistical descriptions of the demographic and disease-related information, pain knowledge and attitudes towards pain management were generated using case numbers, constituent ratios, rates, and $\bar{x} \pm s$. The *t*-test was used to compare the differences in the attitude scores of patients between two groups, and one-way analysis of variance (ANOVA) was used to compare the differences in the attitude scores of patients among several characteristics. Multiple stepwise regression analysis was conducted using the patients' attitudes as the dependent variable, using meaningful variables in the single-factor analysis of patient attitudes, and using the pain knowledge of patients and caregiver attitudes as independent variables. $P < 0.05$ was considered statistically significant.

Results

Sociodemographic and disease characteristics

The mean age of the patients was 54.39 ± 12.72 (range, 18–88) years. There were 170 patients (46.83%) from Beijing and 193 patients (53.17%) outside Beijing. The mean age of the caregivers was 46.07 ± 13.26 (range, 18–76) years. Other sociodemographic data and the disease characteristics of the participants are presented in [Table 1, 2](#).

Attitudes towards pain management

The average scores of attitudes towards pain management for patients and caregivers were 2.96 ± 0.49 and 3.03 ± 0.49 , respectively. The average scores for each attitude dimension for patients and caregivers are shown in [Table 3](#).

Pain knowledge

The pain knowledge scores for patients and caregivers were 44.22 ± 16.29 and 43.69 ± 17.23 , respectively, both of which are below 50 points. The average scores are shown in [Table 4](#).

Factors influencing patient attitudes towards cancer pain management

According to results of the literature review, we found three factors, including pain knowledge of patients, caregivers' attitudes towards cancer pain management, and population statistics and disease relevant factors of patients, that influenced the attitudes of patients towards cancer pain management, and caregivers' attitudes towards cancer pain management were influenced by pain knowledge and population statistics of caregivers. Pain knowledge of patients was influenced by their population statistics and disease relevant factors and pain knowledge of caregivers was influenced by their population statistics.

There was no meaningful variable in single-factor analysis of caregivers' pain knowledge, and the multiple stepwise regression analysis of caregivers' pain knowledge was no longer conducted.

A multiple stepwise regression analysis was conducted using the caregivers' attitudes towards cancer pain management as the dependent variable and education of caregivers, and caregivers' pain knowledge as independent variables according to the single-factor analysis of caregiver attitudes. In a multiple stepwise regression analysis, two factors of the caregivers' pain knowledge and education of caregivers explained 16.1% of the total variance in the average scores of the caregivers' attitudes towards cancer pain management. The education ($\beta = 0.132$, $P = 0.007$) and pain knowledge ($\beta = -0.387$, $P = 0.000$) of caregivers were influencing factors of caregivers' attitudes towards cancer pain management. The attitudes of caregivers of primary school or below were the worst. The attitudes of caregivers with high pain knowledge were better than others.

A multiple stepwise regression analysis was conducted using the patients' pain knowledge as the dependent variable and the meaningful variable in a single-factor analysis of patients' pain knowledge (number of previous surgeries and metastatic statuses) as independent variables. In a multiple stepwise regression analysis, one factor of the metastatic statuses entered into the regression equation.

Differences in the average patient attitude scores were observed among patients with different numbers of previous radiotherapy treatments, different metastatic statuses, different degree of pain relief, patients' pain knowledge and caregivers' attitudes towards cancer pain management in a single-factor analysis using the *t*-test and ANOVA ([Table 1](#)). The attitudes of patients who had never undergone radiotherapy were the worst, and who had

Table 1 Sociodemographic and disease characteristics of the patients (N=363)

Item	n	Proportion (%)	Attitude scores		F/t	Item	n	Proportion (%)	Attitude scores		F/t
			Mean	SD					Mean	SD	
Gender					0.224	Others	19	5.23	2.90	0.53	
Male	190	52.34	2.97	0.46		Number of previous surgeries (N=362)					2.639
Female	173	47.66	2.96	0.51		0	167	46.13	3.00	0.48	
Age (year)					0.199	1	164	45.30	2.96	0.49	
≤44	74	20.39	2.98	0.50		>1	31	8.57	2.78	0.50	
45-59	143	39.39	2.98	0.48		Number of previous chemotherapy treatments (N=358)					0.590
≥60	146	40.22	2.94	0.49		0	112	31.28	2.94	0.46	
Education					0.528	1-3	116	32.40	2.94	0.47	
Primary school or below	56	15.43	3.00	0.43		4-8	100	27.93	3.02	0.53	
Middle school	107	29.48	2.98	0.49		>9	30	8.39	2.95	0.53	
Technical secondary school/high school	99	27.27	2.91	0.48		Current chemotherapy					-0.602
Associate's degree or above	101	27.82	2.96	0.53		Yes	269	74.10	2.95	0.48	
Marital status					0.297	No	94	25.90	2.99	0.51	
Unmarried	10	2.75	2.98	0.53		Number of previous radiotherapy treatments (N=362)					3.616*
Married	349	96.15	2.96	0.49		0	284	78.45	3.00	0.47	
Widowed	4	1.10	3.15	0.31		1	52	14.36	2.83	0.56	
Career					0.697	>1	26	7.19	2.83	0.46	
Worker	80	22.04	3.01	0.48		Current radiotherapy					0.641
Peasant	101	27.82	3.00	0.45		Yes	42	11.57	3.01	0.50	
Employee of an enterprise or public institution	140	38.57	2.92	0.54		No	321	88.43	2.96	0.49	
Freelancers	14	3.86	2.87	0.41		Metastasis					-2.678**
Others	28	7.71	2.93	0.42		Yes	165	45.45	2.89	0.52	
Average monthly family income (RMB)					1.395	No	198	54.55	3.03	0.45	
≤1,000	31	8.54	2.88	0.48		Pain location					1.182
1,001-3,000	105	28.93	3.01	0.49		Single	291	80.17	2.98	0.48	
3,001-6,000	159	43.80	2.93	0.49		Multiple	72	19.83	2.90	0.52	
6,001-10,000	42	11.57	3.08	0.47		Duration of pain (h)					0.396
>10,000	26	7.16	2.89	0.48		<1	68	23.86	2.95	0.51	
Hospital charges paid by					-0.162	1-24	135	47.37	2.94	0.49	
Public health service and medical insurance	259	71.35	2.96	0.50		>24	82	28.77	2.89	0.51	
New rural cooperative health service and self-paid	104	28.65	2.97	0.44		Degree of pain relief					14.667**
Disease diagnosis					0.983	<30%	57	15.70	3.11	0.43	
Lung cancer	128	35.26	2.90	0.45		30%-50%	121	33.34	3.02	0.40	
Oral, nasopharyngeal, esophageal and gastrointestinal cancers	96	26.45	3.03	0.50		51%-70%	71	19.56	2.97	0.56	
Breast cancer	63	17.36	3.01	0.49		>70%	114	31.40	2.82	0.52	
Liver and pancreatic cancers and lymphoma	31	8.54	2.92	0.54		Pain knowledge of patients					6.801**
Kidney, ureter, bladder, ovarian and uterine cancers	26	7.16	2.98	0.51		<50	196	0.54	3.11	0.45	
						≥50	167	0.46	2.78	0.47	
						Attitudes towards pain management of caregivers					-4.508**
						<2.5	44	0.12	2.66	0.46	
						≥2.5	319	0.88	3.00	0.48	

SD, standard deviation; *, P<0.05; **, P<0.01.

Table 2 Sociodemographic characteristics of the caregivers (N=363)

Item	n	Proportion (%)	Item	n	Proportion (%)
Gender			Peasant	76	20.94
Male	166	45.73	Employee of an enterprise or public institution	136	37.47
Female	197	54.27	Freelancers	28	7.71
Age (year)			Others	33	9.09
≤44	165	45.45	Relationship to patient		
45–59	128	35.26	Spouse	200	55.10
≥60	70	19.29	Parent	16	4.40
Education			Child	105	28.93
Primary school or below	20	5.51	Brother and sister	24	6.61
Middle school	92	25.34	Other relatives	18	4.96
Technical secondary school/high school	107	29.48	Duration of caring for patient (month)		
Associate's degree or above	144	39.67	≤6	235	64.74
Career			7–12	55	15.15
Worker	90	24.79	>12	73	20.11

Table 3 Average scores for each dimension of attitude towards cancer pain management for the patients and caregivers

Dimension	Patient		Caregiver	
	Score ($\bar{x}\pm s$)	Rank	Score ($\bar{x}\pm s$)	Rank
Tolerance	3.83±0.96	1	3.74±0.88	1
Use of analgesics as needed (<i>p.r.n.</i>)	3.73±1.01	2	3.51±0.81	2
Addiction	3.44±1.05	3	3.43±1.07	3
Disease progression	3.28±1.26	4	3.27±1.18	4
Distraction of physicians	3.16±1.07	5	3.01±1.06	6
Side effects	2.99±0.68	6	3.22±0.65	5
Desire to be good	2.22±1.04	7	2.38±1.03	7
Fatalism	2.08±0.81	8	2.31±0.79	8
Religious fatalism	1.86±1.00	9	2.02±0.99	9

undergone radiotherapy more than once were relatively good. The attitudes of patients with metastatic cancer were better than those of patients without metastasis. The attitudes of patients whose degree of pain relief were less than 30% were the worst, and whose degree of pain relief were more than 70% were the best. The attitudes of patients whose pain knowledge were less than 50 were worse than others. The attitudes of patients whose caregivers had less than 2.5 of attitude score were better than others.

A multiple stepwise regression analysis was conducted using the patients' attitudes towards cancer pain management as the dependent variable and the patients' pain knowledge, the caregivers' attitudes towards cancer pain management, numbers of previous radiotherapy

treatments, the degree of pain relief and cancer metastasis as independent variables according to the single-factor analysis of patient attitudes. In a multiple stepwise regression analysis, two factors were entered into the regression equation: the patients' pain knowledge and the caregivers' attitudes towards cancer pain management. These two factors explained 23.2% of the total variance in the average scores of the patients' attitudes towards cancer pain management ($R^2=0.252$, adjusted $R^2=0.232$, $F=12.610$, $P=0.000$) (*Table 5*).

The regression equation of patients' attitudes towards pain management is as follow: the score of patient's attitude towards pain management = $2.376 - 0.010 \times$ the score of patient's pain knowledge + $0.309 \times$ the score of caregiver's attitude towards pain management. The pain knowledge of

Table 4 Pain knowledge item accuracy values for patients and caregivers

Item	Patient (N=363)			Caregiver (N=363)		
	Person-times of correct answers	Accuracy (%)	Rank	Person-times of correct answers	Accuracy (%)	Rank
Cancer pain can be relieved	301	82.92	1	277	76.31	1
The effect of non-medical treatment is the same as that of drug therapy	258	71.07	2	232	63.91	2
Opioid analgesics can interfere with breathing	235	64.74	3	194	53.44	3
If pain gets worse, it means the cancer is getting worse	166	45.73	4	165	45.45	4
A need for increasing doses of opioid analgesics indicates addiction	164	45.18	5	138	38.02	7
It is better to give analgesics around the clock than only when needed	149	41.05	6	157	43.25	6
Addiction refers to a person's desire to use drugs for their effects on their mind or emotions rather than to relieve pain	111	30.58	7	165	45.45	5
Patients will become addicted to opioid analgesics over time	105	28.93	8	100	27.55	9
Analgesics should be given only when pain is severe	82	22.59	9	121	33.33	8
It is better to give the lowest amount of analgesics early on so that larger doses can be used later if pain increases	34	9.37	10	37	10.19	10

Table 5 Multiple stepwise regression analysis of patients' attitudes towards pain management

Variables	B	S.E.	β	t	P
Constant	2.376	0.352		6.750	0.000
Patients' pain knowledge	-0.010	0.003	-0.336	-3.313	0.001
Caregivers' attitudes towards cancer pain management	0.309	0.099	0.318	3.133	0.002

S.E., standard error.

patients ($\beta=-0.336$, $P=0.001$) and caregivers' attitudes towards pain management ($\beta=0.318$, $P=0.002$) were influencing factors of patients' attitudes towards pain management. The attitudes of patients with high pain knowledge were better than others. The attitudes of patients whose caregivers had low level of attitudes were better than others.

Discussion

Scores of 2.5 and higher on the BQT indicated a poor attitude and a high level of attitude barriers regarding cancer pain management (27). The patient attitude score in this study (2.96 ± 0.49) indicated that the general attitude of the cancer patients towards pain management was poor. The scores of our samples were higher than those reported for cancer patients in the US (1.65), Turkey (1.94) and Jordan (2.58) (27,29,30), and were approximately consistent with those of cancer patients in Taiwan, China (2.98) and

Hong Kong, China (2.96) (29). The dimension scores indicated good attitudes in three areas (scores <2.5), "Desire to be good" (2.22 ± 1.04), "Fatalism" (2.08 ± 0.81) and "Religious fatalism" (1.86 ± 1.00), and poor attitudes in six areas (scores ≥ 2.5), "Tolerance" (3.83 ± 0.96), "Use of analgesics as needed (*p.r.n.*)" (3.73 ± 1.01), "Addiction" (3.44 ± 1.05), "Disease progression" (3.28 ± 1.26), "Distraction of physicians" (3.16 ± 1.07) and "Side effects" (2.99 ± 0.68) (Table 3). Research indicates that the dimension scores of cancer patient towards pain management were 2.46–3.64, and cancer patients' attitudes regarding "Disease progression" (3.64) and "Use of analgesics as needed (*p.r.n.*)" (3.62) were the worst (17). Cancer patients' attitudes regarding "Distraction of physicians" (2.5 ± 1.0) and "Fatalism" (1.8 ± 1.0) were the best (27). The results of these studies were consistent with our results. The items that directly affected the patients' attitude scores included "Analgesics should be given when there is a real need",

“Patients will become addicted to analgesics and should try not to use it unless they are unable to bear the pain”, “If you take analgesics when you have mild pain, it might not work when the pain becomes worse”, and “Using analgesics can harm the liver and kidneys”. This finding was similar to the research results of Mohammad *et al.* (27), Tosun *et al.* (30), and Sun *et al.* (4). Therefore, patients’ attitude scores could improve if health professionals provided health education related to addiction, tolerance, side effects, and the timing, interval and dosage of analgesic use.

The factors that influence patients’ attitudes towards cancer pain management were analyzed in this study, and included the caregivers’ attitudes towards cancer pain management, and the patients’ pain knowledge (Table 5).

The problem that this study aimed to solve was how to help health professionals improve patients’ attitudes towards pain management and enhance their adherence to taking analgesics and reporting pain. According to results of the literature review, we should consider two factors that influence the attitudes of patients. First, the knowledge, belief and attitude, and practice model indicated that receiving knowledge is an important basis and premise for forming correct beliefs and positive attitudes (31-33). Receiving pain knowledge is also an important basis for the formation of better attitudes towards pain management among cancer patients. Second, the Heider’s balance theory is an important theory about interpersonal relationships and changes in attitudes. This theory indicates that the attitudes of a cognitive subject towards a cognitive object are often influenced by the attitudes of referrers towards the cognitive object, and this influence is based on the premise of the cognitive subject’s emotional relationship (e.g., like or disgust) towards the referrers. When a subject discovers that the opinion of his/her favourite person is the same as that of the subject himself/herself, then the subject’s mental state is balanced; however, when the subject discovers that his/her favourite person’s opinion is opposed to his/her own, he/she will experience an unbalanced mental state, such as nervousness or displeasure, and will show a tendency to seek a balanced state. In this way, changes in attitude may occur (34,35). The patients and caregivers in our study were all relatives (Table 2); 200 caregivers were the spouses of the patients (55.10%), 105 were their children (28.93%), 16 were the parents (4.40%), 24 were the brothers or sisters (6.61%), and 18 were other relatives (4.96%). Of the caregivers, 64.74% had cared for the patients within 6 months, and 20.11% for more than 12 months. Because all of the

patients and caregivers were relatives and these caregivers could care for the patients for long periods, the emotional relationships between the patients and caregivers were always favourable and confirmed. In this study, the attitudes of cancer patients towards pain management were often influenced by their caregivers’ attitudes towards pain management on the premise of the favourable emotional relationship between the patients and their caregivers. When a patient discovers that his/her caregiver shares his/her opinion about cancer pain management, the patient’s mental state is balanced; however, when a patient discovers that his/her caregiver opposes his/her opinion about cancer pain management, the patient experiences an unbalanced mental state, and tends to seek a balanced state by changing his/her own attitude.

This study found that the patients’ attitudes towards cancer pain management were influenced by their caregivers’ attitudes. Under the assumption that the other explanatory variables were invariable, the patients’ attitude scores would increase by 0.309 units when the caregivers’ attitude scores increased by one unit. Researchers have discovered that patients’ attitudes towards cancer pain management are influenced by caregivers’ concerns about pain medication (36). Caregivers harboured misconceptions about cancer pain management in terms of side effects, addiction to analgesics, disease progression, and desire to be good, which were similar to those of the patients (37). There were significant correlations between the concerns of patients and their caregivers regarding side effects, addiction, tolerance, and fatalism (13). These findings showed that patients’ attitudes towards cancer pain management could be improved by improving caregivers’ attitudes towards pain management. The average caregiver attitude score in this study (3.03 ± 0.49) was higher than the score that Lin *et al.* reported for the caregivers of patients at a tumour clinic in Taiwan, China (2.34) and the results that Ward *et al.* reported for caregivers of patients receiving palliative treatment at an institution in the US (1.80) (24). The range of caregivers’ attitude dimension scores in this study (2.02–3.74) was higher than that reported by Vallerand *et al.* (1.05–2.41) (26). The latter result was comparable with Berry and Ward’s results regarding the dimension scores of caregivers caring for patients in a palliative treatment institution. The highest dimension scores in these three studies were all related to side effects and addiction to medication (5). Caregivers’ attitudes towards cancer pain management were influenced by their age, gender, education level, career, and relationship with the patients. The older the caregivers

were, the worse their attitudes were (38). Male caregivers had significantly greater concerns about cancer pain management than female caregivers (13). Less educated caregivers, caregivers who were homemakers, and retired caregivers had greater concerns than other groups of caregivers (5,13). In this study, caregivers' attitudes towards pain management were influenced by education of caregivers. The attitudes of caregivers with education of primary school or below were the worst. Studies indicated that caregivers with higher levels of pain knowledge had significantly fewer attitude barriers towards cancer pain management (5,26). In this study, the caregivers' attitudes towards cancer pain management could also be influenced by the caregivers' pain knowledge. The attitude scores of caregivers with low level of pain knowledge were high. Thus, we could help improve patients' attitudes by improving caregiver attitudes through health education about pain knowledge for caregivers according to their education degree. We should also pay greater attention to caregivers' concerns about side effects and drug addiction in clinical nursing work.

This study found that patients' attitudes towards cancer pain management were influenced by the patients' pain knowledge. Assuming that other explanatory factors were invariable, patients' attitude scores would decrease by 0.010 units when their pain knowledge scores increased by one unit. The primary cause of uncontrolled pain for 42% of patients was their incorrect beliefs about analgesics, which reduced their willingness to report pain and take analgesics (39). The patients with low levels of pain knowledge had concerns about analgesic administration (40). This finding showed that increasing patients' pain knowledge would help to improve their attitudes towards pain management. The patients' scores for pain knowledge in this study (44.22 ± 16.29), which were less than 50, were approximately the same as the caregivers' scores (43.69 ± 17.23) and higher than the results reported by Pan (25.00) (41) and Qin (24.70) (25). Both patients and caregivers had the highest accuracy for the items "Cancer pain can be relieved", "The effects of non-medical treatment and drug therapy", and "Opioid analgesics can interfere with breathing" (ranked in order from highest to lowest accuracy) and the lowest accuracy for "Addiction", "Analgesics administration time", and "Dosage of analgesics". Seven out of 10 items had accuracy scores of less than 50% for both patients and caregivers; and all were related to aspects of disease progression, addiction, and the time, interval and dosage of analgesic administration (Table 4). In this study, the pain knowledge of patients with metastatic cancer was better than those of patients without metastasis. Thus, patients'

attitudes could be improved if we provided health education about pain knowledge for patients, especially information related to beliefs about the relationship between pain and disease progression and addiction and methods of analgesic application. We should pay more attention to the pain knowledge of patients without metastasis.

The results of this study showed that patients' attitudes towards cancer pain management were poor and need to be improved. We observed that patient attitudes towards "Addiction", "*p.r.n.*", "Tolerance", "Disease progression", "Distraction of physicians" and "Side effects" were poor, and patient attitudes towards "Religious fatalism", "Fatalism" and "Desire to be good" were good. Patients' attitudes were influenced by their caregivers' attitudes and the patients' pain knowledge. Therefore, patients' attitude scores could be improved if health care providers offered health education about pain knowledge to caregivers to improve the caregivers' attitudes, particularly regarding their concerns about side effects and medicine addiction, according to the caregivers' education; and if we provided health education to improve patients' pain knowledge, especially regarding disease progression, addiction, and the timing, interval and dosage of analgesics, according to the metastatic statuses of the patients.

There are two types of limitations to this study. First, because we studied cancer patients specifically and data acquisition was difficult, we obtained data from a convenience sample, which leads to some degree of selection bias. Second, the hospitals included in this study provide a high level of disease treatment in China, and further study is needed to verify whether our conclusions are representative of hospitals of other grades and in other regions.

Conclusions

The patients' attitudes towards cancer pain management were poor and need to be improved. Their attitudes regarding "Addiction", "*p.r.n.*" and "Tolerance" were poor, but regarding "Religious fatalism", "Fatalism" and "Desire to be good" were good. The patients' attitudes towards cancer pain management were influenced by their caregivers' attitudes and the patients' pain knowledge.

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Footnote

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