

Knowledge and attitudes regarding cancer pain management among oncology nurses in China

Journal of International Medical Research

49(1) 1–11

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DOI: 10.1177/0300060520979448

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Abstract

Objective: There are limited studies examining knowledge and attitudes among Chinese oncology nurses regarding cancer pain management.

Methods: We conducted a cross-sectional survey among oncology nurses from 26 hospitals in China. The nurses completed the Knowledge and Attitudes Survey Regarding Pain (KASRP) questionnaire. Multivariate models were used to identify factors associated with nurses' KASRP score.

Results: A total of 982 nurses completed the KASRP (mean score = 21.56 ± 4.00), and 8 (0.81%) nurses had a passing score. The results of multivariate regression indicated that clinical rank and experience in cancer pain management were associated with good knowledge and attitudes regarding cancer pain management.

Conclusion: The Chinese nurses in our study did not have adequate knowledge of or positive attitudes related to cancer pain management. Clinical rank and experience caring for patients with cancer could be used to help identify nurses with inadequate knowledge and attitudes regarding treating cancer pain.

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Keywords

Pain management, patients with cancer, knowledge, attitudes, oncology nurses, cross-sectional study

Date received: 20 August 2020; accepted: 12 November 2020

Introduction

The prevalence of cancer continues to increase on a yearly basis with rapidly ageing populations.¹ Treatments for cancer have improved greatly, and therefore, survival has also improved.¹ However, these improvements have resulted in more patients experiencing cancer pain owing to either treatment or the disease itself. For this reason, effective management of cancer pain is of great importance, to optimize quality of life in these patients.²

Pain, including cancer pain, is a personal, multifaceted experience influenced by culture, previous experience, and coping strategies.³ Cancer pain is associated with more emergency department visits, more hospitalizations, and lower patient satisfaction.⁴ Treatment of pain involves a multimodal approach, especially in the field of cancer. Pain and its management require specialized knowledge in terms of concepts, drugs, and pathophysiology.⁵ Knowing how to and being able to manage patients' cancer pain is crucial to improving their quality of life.⁶

To date, however, few studies have explored knowledge and attitudes regarding cancer pain management among Chinese oncology nurses. Reports thus far are largely from Western countries.⁷ For example, a study by Hroch et al.⁸ found that knowledge and attitudes regarding cancer pain management varied among practicing institutes and according to the language used, as well as the prior experience of nurses caring for patients with pain. Studies among

Chinese oncology nurses are lacking. This is crucial because pain is highly influenced by the sociocultural context, and a different cultural makeup will affect the way care is delivered to patients with cancer pain.⁹ A recently published study by Yu et al.¹⁰ investigated knowledge and attitudes among Chinese oncology nurses with regard to cancer pain management. However, in their study, the survey was administered during an education course on cancer symptom management; thus, the motivation and knowledge levels of participating nurses may differ from those of nurses working in cancer wards.¹⁰ Therefore, further investigation is needed to address this gap and guide administrators in equipping oncology nurses accordingly and improving the quality of care they provide to patients with cancer pain.

In this study, we aimed to assess knowledge and attitudes among Chinese oncology nurses regarding cancer pain management and to identify factors associated with improved knowledge and attitudes with respect to management of patients with cancer pain. The findings of this study will allow us to develop suitable interventions to improve cancer pain management, to thereby improve quality of life among patients with cancer in China.

Methods

Study design

We conducted a cross-sectional study using convenience sampling from September to

December 2019 in 26 hospitals located throughout 12 provinces of China. These provinces were Beijing, Shanxi, Tianjing, Shandong, Hubei, Zhejiang, Guangxi, Anhui, Heilongjiang, Inner Mongolia, Liaoning, and Jiangsu. This study was approved by the Research Ethics Committee of the Fifth Medical Center of the Chinese People's Liberation Army General Hospital in Beijing, China on November 5, 2018 (Approval ID: ky-2018-11-100).

Participants

We recruited oncology nurses who were licensed and were working in a cancer department. Our request for a waiver of informed consent was approved by the Research Ethics Committee of the Fifth Medical Center of the Chinese People's Liberation Army General Hospital. We excluded oncology nurses who were interns, in training, or completing a temporary rotation in a cancer department.

Data collection

We collected sociodemographic data and used the Knowledge and Attitudes Survey Regarding Pain (KASRP) (2014) questionnaire to assess nurses' knowledge and attitudes regarding cancer pain management. Sociodemographic data included age, sex, education level, clinical rank, clinical experience, years working in a cancer department, years of experience managing cancer pain, type of hospital, completion of cancer pain or related training, and presence of information collected on cancer pain.

The KASRP is a widely recognized and validated tool used to assess knowledge and attitudes regarding pain. The KASRP is a 41-item questionnaire that consists of 22 true or false questions, 13 multiple-choice questions, and 2 case studies with two

responses each. The KASRP has an internal consistency >0.7 and a test-retest reliability >0.8 .¹¹ Each correctly answered item is assigned a score of 1; otherwise, a score of 0 is assigned. The total score for each participant ranges from 0 (the lowest) to 41 (the highest). The percentage of correct responses is calculated for evaluation. A score of 80% is the minimum acceptable score, indicating acceptable knowledge and attitudes regarding pain.

Statistical analysis

In this study, the necessary sample size was estimated to be 10 to 20 times the number of questionnaire items. Descriptive data are presented as frequency and percentage or mean and standard deviation. To identify factors associated with the KASRP score, bivariate analysis was conducted using either the Student *t*-test or one-way analysis of variance. Factors with a *p* value <0.05 were included in the multivariate linear regression analysis. Values of $p < 0.05$ were considered statistically significant. We used IBM SPSS 20.0 (IBM Corp., Armonk, NY, USA) for data analysis.

Results

In this study, 1006 questionnaires were sent out and 982 nurses responded, yielding a response rate of 97.61%. Therefore, 982 nurses were included in the present study. Most participants were between 26 and 35 years old (63.6%) and were women (99.1%). Most participants had worked for more than 5 years (61.5%) and had more than 5 years' experience in cancer care. The detailed characteristics of participants are presented in Table 1. Only 8 (0.81%) of the included oncology nurses had a passing score on the KASRP; the mean KASRP score among all 982 nurses was 21.56 ± 4.00 .

Table 1. Characteristics of oncology nurses in China who participated in this study (N = 982).

Characteristics	n (%)
Age, years	
<26	208 (21.2)
26–35	625 (63.6)
36–45	131 (13.3)
>45	18 (1.8)
Female sex	973 (99.1)
Education status	
Secondary	12 (1.2)
Degree	334 (34.0)
Specialization	630 (64.2)
Masters	6 (0.6)
Clinical rank	
Nurse	251 (25.6)
Senior nurse	552 (56.2)
Supervisor	165 (16.8)
Assistant head	14 (1.4)
Years of clinical practice	
<6	378 (38.5)
6–10	364 (37.1)
11–15	149 (15.2)
16–20	50 (5.1)
>20	41 (4.2)
Years of experience in oncology nursing	
<6	438 (44.6)
6–10	348 (35.4)
11–15	126 (12.8)
16–20	38 (3.9)
>20	32 (3.3)
Hospital setting	
Specialized unit	277 (28.2)
General unit	705 (71.8)
Years of experience in managing cancer pain	
0	32 (3.3)
1–3	166 (16.9)
4–6	172 (17.5)
7–9	146 (14.9)
>9	466 (47.5)
Previous cancer pain management training	605 (61.9)

The results of bivariate analysis of participants according to KASRP score are presented in Table 2. Age, sex, education status, clinical rank, clinical experience, experience in cancer care, and experience

in cancer pain management were associated with KASRP scores ($p < 0.05$). These factors were entered in the multivariate analysis, which identified a higher clinical rank and greater number of years' experience in cancer pain care as being associated with a higher KASRP score, ($p < 0.05$), shown in Table 3.

The numbers and percentages of participants who provided correct answers for each of the 38 questions in the KASRP are given in Table 4. In ascending order according to the proportion of nurses who provided the correct response, the questions with the highest percentage of correct responses were numbers 14 (90.4%), 32 (90.1%), 11 (89.5%), 22 (87.7%), 21 (81.7%), 34 (79.8%), 10 (78.2%), 31 (76.8%), 12 (73.7%), and 26 (72.7%). In descending order according to the proportion of nurses who provided the correct response, questions with the lowest percentage of correct responses were numbers 38–2 (8.6%), 36 (12.5%), 28 (15.0%), 39–2 (20.3%), 17 (21.0%), 38–1 (22.4%), 4 (22.5%), 24 (26.9%), 15 (35.9%), and 19 (37.9%).

Discussion

We conducted a large survey among Chinese oncology nurses to explore their knowledge and attitudes regarding cancer pain management. We found that a higher clinical rank and more years of experience in cancer pain care resulted in better knowledge and attitudes regarding cancer pain management.

Overall, the survey response rate was 97.61% in this study, which may suggest that the target population was interested in the topic of pain management in a clinical setting. The KASRP questionnaire is an effective tool for measuring both the knowledge and attitudes of oncology nurses in relation to pain, according to four dimensions: general knowledge and

Table 2. Bivariate analysis of characteristics potentially associated with knowledge and attitudes related to cancer pain management (N = 982).

Characteristics	Scores	p value
Age, years		
<26	21.46 ± 3.72	<0.01
26–35	22.44 ± 4.24	
36–45	22.87 ± 4.55	
>45	22.94 ± 4.77	
Sex		
Male	19.44 ± 5.22	0.04
Female	22.33 ± 4.19	
Education status		
Secondary	19.08 ± 4.98	<0.01
Degree	21.77 ± 4.05	
Specialization	21.50 ± 5.24	
Masters	21.25 ± 3.96	
Clinical rank		
Nurse	21.25 ± 3.96	<0.01
Senior nurse	22.31 ± 4.23	
Supervisor	23.70 ± 3.88	
Assistant head	24.07 ± 5.95	
Hospital setting		
Specialized unit	22.18 ± 4.42	0.56
General unit	22.35 ± 4.13	
Years of experience in managing cancer pain		
0	21.41 ± 5.18	<0.01
1–3	21.32 ± 4.21	
4–6	21.85 ± 3.97	
7–9	23.67 ± 4.32	
>9	22.45 ± 4.07	

attitudes regarding cancer pain, and knowledge and attitudes related to analgesic drugs, pain assessment, and pain intervention. A score of less than 80% indicates that a seriously compromised ability of the nurse to care for a patient experiencing pain, thus calling for further professional training. In this study, the mean score among our participants was 21.56 ± 4.00 (mean KASRP correct percentage of $54.4\% \pm 23.5\%$), and only 8 (0.81%) oncology nurses attained a passing score on the KASRP questionnaire. These results are a little lower than previously reported in studies, such as those performed by Yu et al. and Hroch et al.,^{8,10} in which the mean KASRP percentage among

oncology nurses was $56.1\% \pm 11.0\%$ and $66.7\% \pm 9.1\%$, respectively. A probable reason for this difference is that Yu et al. and Hroch et al. conducted their studies during a training course on cancer symptom management; thus, most participants had been recently equipped with relevant knowledge and attitudes in relation to cancer pain management.^{8,10}

The KASRP is a useful tool for identifying needs for further training and/or as a pre- and post-test evaluation measure in educational programs. In clinical practice, oncology nurses must be familiar with the route of administration, dose titration, and side effects of analgesics, so as to provide

Table 3. Multivariate regression of factors associated with KASRP score for knowledge and attitudes related to cancer pain management (N = 982).

Factor	Coefficient	95% CI	p value
Age^a			
26–35 years	0.04	–0.78, 0.87	0.91
36–45 years	–0.62	–1.81, 0.55	0.29
>45 years	–1.63	–4.16, 0.89	0.20
Sex^b			
Female	2.58	–0.14, 5.31	0.06
Educational status^c			
Degree	1.81	–0.59, 4.22	0.14
Specialization	1.90	–0.53, 4.34	0.12
Masters	0.46	–3.65, 4.59	0.82
Clinical rank^d			
Nurse	–0.86	–1.67, –0.04	0.03
Supervisor	1.69	0.85, 2.53	<0.01
Assistant Head	3.40	0.68, 6.13	0.01
Years in cancer pain management^e			
0	–0.19	–1.76, 1.37	0.80
1–3	–0.44	–1.31, 0.43	0.32
7–9	1.70	0.79, 2.60	<0.01
≥10	0.57	–0.14, 1.29	0.12

^a<25 years old; ^bMale; ^cSecondary or below; ^dSenior nurse; ^e4–6 years.

KASRP, Knowledge and Attitudes Survey Regarding Pain; CI, confidence interval.

prompt and correct medication for patients. In the present study, we found that the 10 questionnaire items with the lowest scores were questions 38–2, 36, 28, 39–2, 17, 38–1, 4, 24, 15, and 19. These 10 items involved dose titration (questions 39–2, 38–1, and 38–2), side effects of analgesics (questions 28 and 36), analgesics use (questions 15, 17, and 19), and administration route (question 24), in line with prior studies.¹⁰ Therefore, necessary actions must be implemented that focus on improving these deficiencies.

Our study findings showed that the 10 questionnaire items with the highest scores were questions 14, 32, 11, 22, 21, 34, 10, 31, 12, and 26. These items related to opioid pain management (questions 10, 11, 14, 22, 26, and 34) and pain assessment (questions 12, 21, and 31). The results for most of these items are in accordance with published data.¹⁰

We found that higher clinical rank and more years of experience managing cancer pain were associated with a higher KASRP score. These findings are largely similar to those of Bouya et al.,¹² who identified previous pain-related education programs, experience working on a pain team, experience caring for patients with cancer, age, level of education, and care environment as factors associated with KASRP scores. However, clinical rank and years of experience were not associated with KASRP scores in a study by Al-Atiyyat et al.,¹³ which may be owing to differences in the training and development programs on cancer pain management provided in different countries. Interventions targeting oncology nurses' long-term progression and training within the same department, to deepen their expertise regarding the treatment of cancer and its related symptoms, are potentially useful for improving quality

Table 4. Questions answered correctly by participants (N = 982).

Question (Correct answer)	Correct response	
	n	%
1 Vital signs are always reliable indicators of the intensity of a patient's pain.	708	72.1
2 Because their nervous system is underdeveloped, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences.	390	39.7
3 Patients who can be distracted from pain usually do not have severe pain.	471	48
4 Patients may sleep despite severe pain.	221	22.5
5 Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.	649	66.1
6 Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.	421	42.9
7 Combining analgesics that work via different mechanisms (e.g., combining an opioid with an NSAID) may result in better pain control with fewer side effects than using a single analgesic agent.	682	69.5
8 The usual duration of analgesia for a 1–2 mg morphine IV is 4–5 hours.	427	43.5
9 Opioids should not be used in patients with a history of substance abuse. (False) Research shows that promethazine (Phenergan) and hydroxyzine (Vistaril) are reliable potentiators of opioid analgesics.	599	61
10 Older patients cannot tolerate opioids for pain relief.	768	78.2
11 Patients should be encouraged to endure as much pain as possible before using an opioid.	879	89.5
12 Children younger than 11 years old cannot reliably report pain so oncology nurses should rely solely on a parent's assessment of the child's pain intensity.	724	73.7
13 Patients' spiritual beliefs may lead them to think that pain and suffering are necessary.	580	59.1
14 After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.	888	90.4
15 Giving patients sterile water by injection (placebo) is a useful test to determine whether their pain is real.	353	35.9
16 Oxycodone & acetaminophen tablet (5 mg oxycodone + 325 mg paracetamol) PO is approximately equal to 7.5–10 mg of morphine PO.	611	62.2
17 If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.	206	21
18 Anticonvulsant drugs such as carbamazepine (Tegretol) produce optimal pain relief after a single dose.	577	58.8
19 Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regimen.	372	37.9

(continued)

Table 4. Continued.

Question (Correct answer)	Correct response	
	n	%
20 Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.	688	70.1
21 The term "equianalgesia" means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief.	802	81.7
22 Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression.	861	87.7
23 The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is:	692	70.5
24 The recommended administration route of opioid analgesics for patients with brief, severe pain of sudden onset, such as trauma or postoperative pain, is:	264	26.9
25 Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain in patients with cancer?	661	67.3
26 Which of the following IV doses of morphine administered over a 4-hour period would be equivalent to 30 mg of oral morphine given every 4 hours?	714	72.7
27 Analgesics for post-operative pain should initially be given:	492	50.1
28 A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday, the patient was receiving morphine 200 mg/hour intravenously. Today, he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is:	147	15
29 The most likely reason a patient with pain would request increased doses of pain medication is:	678	69
30 Which of the following is useful for treatment of cancer pain?	386	39.3
31 The most accurate judge of the intensity of the patient's pain is:	754	76.8
32 Which of the following describes the best approach to cultural considerations in caring for patients with pain:	885	90.1
33 How likely it is that patients who develop pain already have an alcohol and drug abuse problem?	551	56.1
34 The time to peak effect for morphine given IV is:	784	79.8
35 The time to peak effect for morphine given orally is:	592	60.3
36 Following abrupt discontinuation of an opioid, physical dependence is manifested as the following:	123	12.5
37. Which statement is true regarding opioid-induced respiratory depression?	393	40
38-I Patient A: Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles	220	22.4

(continued)

Table 4. Continued.

Question (Correct answer)	Correct response	
	n	%
at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort), he rates his pain as 8. On the patient's record, you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain.		
38-2 Your assessment (above) is made 2 hours after Andrew received morphine 2 mg IV. Half-hourly pain ratings following the injection ranged from 6 to 8, and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain. The physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you would take at this time.	84	8.6
39-1 Patient B: Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/ discomfort, 10 = worst pain/discomfort), he rates his pain as 8. On the patient's record, you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain:	403	41
39-2 Your assessment (above) is made 2 hours after Robert received morphine 2 mg IV. Half-hourly pain ratings following the injection ranged from 6 to 8, and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you would take at this time.	199	20.3

NSAID, nonsteroidal anti-inflammatory drug; BP, blood pressure; HR, heart rate; R, respiratory rate.

of life in patients with cancer. Educational or training programs could be developed to further improve the knowledge gap regarding cancer pain management among Chinese oncology nurses.¹²

This study has wide-reaching implications for clinical cancer treatment in China. The low scores revealed in this study among many oncology nurses highlight that more training is needed to improve nurses' relevant knowledge, which

will allow them to better manage pain in patients with cancer. The percentage of correct answers was lowest for the case scenarios of the questionnaire survey. This indicates that there is room for the use of more case-based discussions, to develop greater understanding and independent thinking, and to help nurses to better manage their patients with pain.¹⁴ Development and implementation of training programs, as well as measures to retain

oncology nurses in the cancer ward longer, will help to improve the treatment of patients with cancer pain in the future.¹²

The strength of our study was that we recruited a large sample of nearly 1000 oncology nurses covering a wide area of China. This survey was thus representative of the Chinese nursing population. Because we recruited nurses from 26 hospitals and 12 provinces, our study results can be generalized throughout China. We also used a widely validated questionnaire to measure knowledge and attitudes among our participants regarding cancer pain management.

Our study has some limitations. First, the sample was limited to Chinese oncology nurses. Second, our sample had a large number of female oncology nurses. However, the proportion of women was representative of the population of oncology nurses practicing in China. Third, the sampling method used in this study has potential bias, which may affect the findings of this study. Further research is needed to verify our results.

In conclusion, knowledge and attitudes regarding cancer pain management among the Chinese oncology nurses included in this study were low. Sex, clinical rank, and years of experience with managing cancer pain were associated with KASRP scores. More interventions can be developed to help oncology nurses who are new to cancer pain management improve their overall knowledge regarding the management of pain in patients with cancer.


Declaration of conflicting interest

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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