

KNOWLEDGE, ATTITUDES AND BARRIERS OF PHYSICIANS, POLICY MAKERS/REGULATORS REGARDING USE OF OPIOIDS FOR CANCER PAIN MANAGEMENT IN THAILAND

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ABSTRACT

The efficacy of opioids for cancer pain has been proven and the World Health Organization (WHO) three-step ladder has been recommended for cancer pain relief. However, undertreatment of cancer pain has still been reported in Thailand. Identification of barriers to opioid use by the physicians and policy makers/regulators, and their level of knowledge and attitudes concerning its use are influential factors for cancer pain management (CPM). This study was performed to assess the knowledge and attitudes physicians and policy makers/regulators have regarding use of opioids for CPM. Barriers to opioid availability were also studied. A self-administered questionnaire was mailed to 300 physicians and distributed to 58 policy makers/regulators from September to October 2011. A total of 219 physicians and 47 policy makers/regulators completed the questionnaire. Of the physicians 62.1% had inadequate knowledge and 33.8% had negative attitudes. Physicians who did not know the WHO three-step ladder were more likely to have less knowledge than those having used the WHO three-step ladder (OR = 13.0, $p < 0.001$). Policy makers/regulators also had inadequate knowledge (74.5%) and negative attitudes (66.0%). Policy makers/regulators who never had CPM training were likely to have more negative attitudes than those having had training within less than one year (OR = 35.0, $p = 0.005$). Lack of training opportunities and periodic shortages of opioids were the greatest barriers to opioid availability for physicians and policy makers/regulators, respectively. The strengthening of ongoing educational programs regarding opioid use for CPM, and cooperation among key groups are needed.

Key Words: Policy makers, Regulators, Opioids, Cancer pain management, Thailand

INTRODUCTION

Cancer is one of the leading causes of death worldwide.¹⁾ In Thailand, the death rate per 100,000 people from cancer has increased more than two-fold in the past two decades, from 36.8 in 1989 to 87.4 in 2009.²⁾ Pain is a very common symptom in cancer patients, and has a great influence on their overall quality of life.³⁾ Therefore, adequate relief of pain is recognized as a patient's right.⁴⁾ In 1986, the World Health Organization (WHO) developed a set of guidelines

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for cancer pain management (CPM) based on the three-step ladder, which indicated opioids as the drug of choice for the treatment of moderate to severe pain.⁵⁾ Despite the clear WHO recommendations, there are still numerous studies reporting inadequately managed cancer pain in many countries including Thailand.^{6,7)}

Besides the pain management index, the increase of morphine consumption is another indicator of national progress toward improving cancer pain relief, as it is the drug of choice for the management of severe cancer pain and is on the WHO essential drug list.⁸⁾ Therefore, increased opioid consumption can be expected to reflect improved quality of pain control. Despite increases in the annual per capita morphine consumption from 0.29 mg in 1999 to 1.16 mg in 2010, Thailand's morphine consumption continues to be significantly lower than the global mean and remains lower than in many Asian countries.^{9,10)} As a result, there are still many cancer patients suffering from unrelieved pain in Thailand.

Barriers against adequate pain management are as follows: 1) patient-related barriers¹¹⁾ ; 2) professional-related barriers¹²⁻¹⁵⁾ ; and 3) system-related barriers.¹⁶⁾ This study evaluated barriers to opioid use set by policy makers/regulators and physicians, in addition to their knowledge and attitudes, because we consider that policy makers/regulators are important components involved in CPM using opioids. Their policies have the potential to either promote or interfere with CPM.¹⁷⁾ If policy makers and regulators have misconceptions and negative attitudes about opioids for CPM, they can create barriers to the adequate availability and access to them.

The Narcotics Control Division, Food and Drug Administration, Thailand (Thai FDA), has the responsibility of supplying category II opioid narcotics, such as morphine, for medical use in hospitals throughout the country. The regulators in this division have the responsibility of regulating narcotics specified in the Narcotics Act B .E. 2522 (1979). The Narcotics Control Committee plays the key role as policy maker by taking charge of submitted opinions and giving approval regulations for the Minister of Public Health regarding the Narcotics Act.¹⁸⁾

A recent study in Thailand showed that the majority of participating interns who recently graduated from the faculty of medicine demonstrated positive attitudes toward opioid usage for CPM. However, a significant number of them had incorrect knowledge regarding it.¹⁹⁾ Another study of physicians and nurses in a hospital revealed their insufficient knowledge about the optimal use of opioids, and inappropriate pain assessment including negative attitudes towards addiction and tolerance.²⁰⁾ These previous studies had limitations related to generalizability, and they lacked consistency. Furthermore, there has been no published study among Thai policy makers and regulators in this regard. Therefore, it was necessary to conduct this study with the objective of assessing the knowledge and attitudes of physicians, policy makers and regulators regarding opioids for CPM in Thailand. The associations of their knowledge and attitudes with background characteristics were evaluated. Their perceptions regarding the barriers to opioid availability were also studied because it is necessary to improve the availability of opioids in any country.²¹⁾

MATERIALS AND METHODS

This cross-sectional study was conducted in Thailand among two groups of participants from September to October 2011. The first group was physicians working in the hospitals which purchased category II opioids from the Thai FDA. The questionnaire with a cover letter from the Thai FDA was mailed to a simple random sample of 300 hospitals, and then the director of each hospital assigned one physician involved in treating cancer to complete the questionnaire. If no reply was received after one month, a phone call was made to the hospital requesting them

to send the completed questionnaire. For the second group, policy makers and regulators were consolidated into one category which consisted of 19 policy makers of the Narcotics Control Committee and 39 regulators of the Narcotics Control Division, Thai FDA. The questionnaires were administered to 19 policy makers on a meeting day and to 39 pharmacists who had been working as regulators for at least one year.

The self-administered questionnaire was adapted from previous studies with a modification to suit Thailand's situation, and was translated into Thai.^{14,15,19-24} The questionnaire was composed of four parts. The first part included background characteristics. The second and third parts covered knowledge (11 items with 7 negative and 4 positive) and attitudes (8 items with 6 negative and 2 positive) regarding opioids usage, the Narcotics Act, and the availability of opioids for CPM, respectively. Knowledge and attitudes items were arranged in a five-point Likert scale with options of "strongly disagree," "disagree," "uncertain," "agree" and "strongly agree." For the positive questions, the responses of "strongly agree" or "agree" were the correct answers for knowledge, and the desirable answers for attitudes. For the negative questions, "strongly disagree" or "disagree" were the correct answers for knowledge and the desirable answers for attitudes. The final part of the questionnaire covered perception regarding barriers to opioid availability for CPM (12 items). The participants were asked to identify each item concerning barriers with "not a problem," "minor problem," "don't know," "moderate problem" or "serious problem." The responses of "serious problem" were taken for analysis. Content validity was determined by a panel of three experts having expertise in opioid use for CPM. Reliability was assessed by using Cronbach's alpha. The values were 0.78 for knowledge items, 0.63 for attitude items and 0.86 for barrier items.

Descriptive statistics were computed for all items. We scored knowledge items and attitudes items as "1" for each correct or desirable answer, and "0" for each incorrect or non-desirable answer. The total knowledge score and total attitude score were computed for each participant. Inadequate knowledge and negative attitudes were defined as correctly answering less than 70% of the knowledge items (scoring less than 8 out of 11 points), and by answering less than 70% of attitude items (scoring less than 6 out of 8 points), respectively. We applied a 70% cut-off point from a previous study in the Philippines.²⁴ Logistic regression was used to identify associations of background characteristics with inadequate knowledge and negative attitudes. The chi-square test was performed to compare the serious perception of barriers among the two groups of participants. The Statistical Package for Social Science (SPSS) program version 19.0 (SPSS Inc., Chicago, IL, USA) was used for all analyses. A *P* value of < 0.05 was considered statistically significant.

This study was approved by the Ethical Review Committee for Research in Human Subjects, Ministry of Public Health of Thailand in September 2011. Anonymity and confidentiality were maintained throughout.

RESULTS

Background characteristics

We received responses to the questionnaires from 219 (73%) of the 300 physicians and 47 (81%) of the 58 policy makers/regulators. The overall response rate was 74%. Table 1 presents the background characteristics of participants. Physicians and policymakers/regulators were similarly distributed over the categories regarding the last time they received CPM education or training, with no significant difference. Additionally, 42.5% of physicians and 51.1% of policy makers/regulators reported that they had never had CPM education or training. Fifty-eight percent of

Table 1 Background characteristics of participants

Characteristics	Physicians (n=219)		Policy makers/ Regulators (n=47)		P value ^a
	N	(%)	N	(%)	
Gender					0.033
Male	126	(57.5)	19	(40.4)	
Female	93	(42.5)	28	(59.6)	
Age (y)					0.010
≤ 35	110	(50.2)	15	(31.9)	
36–45	64	(29.2)	13	(27.7)	
≥ 46	45	(20.5)	19	(40.4)	
Last time in cancer pain management education or training (y)					0.588
< 1	30	(13.7)	6	(12.8)	
1–5	69	(31.5)	14	(29.8)	
> 5	27	(12.3)	3	(6.4)	
Never	93	(42.5)	24	(51.1)	
Medical specialty					
Board certificate					
Anesthesiology	28	(12.8)			
Surgery	26	(11.9)			
Oncology	13	(5.9)			
Internal medicine	25	(11.4)			
Family medicine	13	(5.9)			
Pediatrics	6	(2.7)			
Obstetrics and Gynecology	8	(3.7)			
Others	8	(3.7)			
General Practice	92	(42.0)			
Hospital type					
Community hospital	130	(59.4)			
General hospital	24	(11.0)			
Regional hospital	22	(10.0)			
Cancer center	6	(2.7)			
Medical school hospital	7	(3.2)			
Private hospital	25	(11.4)			
Others	5	(2.3)			
Number of cancer patients being cared for in the past 6 months					
≤ 10	117	(53.4)			
11–30	64	(29.2)			
≥ 31	38	(17.4)			
Use of the WHO ^b three-step ladder					
Yes	110	(50.2)			
No	44	(20.1)			
Don't know the WHO ^b three-step ladder	65	(29.7)			
Be a member of the palliative care team					
Yes	79	(36.1)			
No	140	(63.9)			

^a P value by Chi-square test; ^b WHO: World Health Organization

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the physicians were specialists, and 42.0% were general practitioners (GPs). More than half (59.4%) practiced in community hospitals, 53.4% had cared for 10 or fewer patients in the past 6 months, and 50.2% used the WHO three-step ladder. Approximately 64.0% of physicians were not members of a palliative care team.

Knowledge regarding use of opioids for CPM

The mean knowledge score of the physicians and policy makers/regulators were 6.4 ± 2.6 and 4.8 ± 2.9 , respectively. Table 2 shows that the lowest percentage of correct answers in both groups was with the item which indicated that physical dependence while on opioids is a sign of addiction (27.4% of the physicians and 19.1% of policy makers/regulators).

Figure 1 demonstrates that the majority of both groups had inadequate knowledge (62.1% of physicians and 74.5% of policy makers/regulators). To identify the associates of background characteristics with inadequate knowledge, further analysis was performed using univariate logistic regression. Table 3 shows that some background characteristics had significant associations with the knowledge level of physicians such as gender; age; last time of CPM education or training; medical specialty; hospital type; number of cancer patients being cared for in the past six months; use of the WHO three-step ladder; and membership in a palliative care team. Gender and last time of CPM education or training had significant effects among policy makers/regulators.

Table 2 Knowledge of participants regarding use of opioids for cancer pain management (CPM)

Items	Physicians (n=219)	Policy makers/Regulators (n=47)	P value ^a
	Correct answer N (%)	Correct answer N (%)	
1. Should use pethidine more than morphine in CPM. ^b	183 (83.6)	31 (66.0)	0.006
2. For long-term use, pethidine causes fewer adverse effects including tolerance and addiction. ^b	118 (53.9)	22 (46.8)	0.378
3. In chronic cancer pain, should not administer opioids on an "around-the-clock" basis. ^b	174 (79.5)	24 (51.1)	<0.001
4. Administering opioids in a PRN ^d dosing schedule can decrease the harmful effect of opioids such as tolerance, addiction or side effect. ^b	112 (51.1)	14 (29.8)	0.008
5. Parenteral administration is more effective than oral administration in pain management. ^b	110 (50.2)	12 (25.5)	0.002
6. Morphine is slowly and incompletely absorbed in the gastrointestinal tract. Patients should not take morphine by mouth even though they can eat food normally. ^b	167 (76.3)	31 (66.0)	0.142
7. The appropriate dose of morphine for cancer pain is whatever dose relieves the pain as completely as possible: there is no ceiling dose for morphine. ^c	125 (57.1)	18 (38.3)	0.019
8. Respiratory depression is serious but is rare when opioids are given at appropriate doses. ^c	130 (59.4)	15 (31.9)	0.001
9. Physical dependence while on opioids is a sign of addiction. ^b	60 (27.4)	9 (19.1)	0.242
10. At the present time, morphine oral solution dosage form is available at Food and Drug Administration, Thailand. ^c	143 (65.3)	27 (57.4)	0.319
11. Due to Narcotics Act B.E. ^e 2522 (1979), no limiting on doses and the number of days' supply that may be provided in a single prescription of category II opioids. ^c	71 (32.4)	22 (46.8)	0.061

^a P value by Chi-square test; ^b Correct answer: "disagree" or "strongly disagree"; ^c Correct answer: "agree" or "strongly agree"; ^d PRN (pro re nata) = as needed; ^e B.E. = Buddhist Era

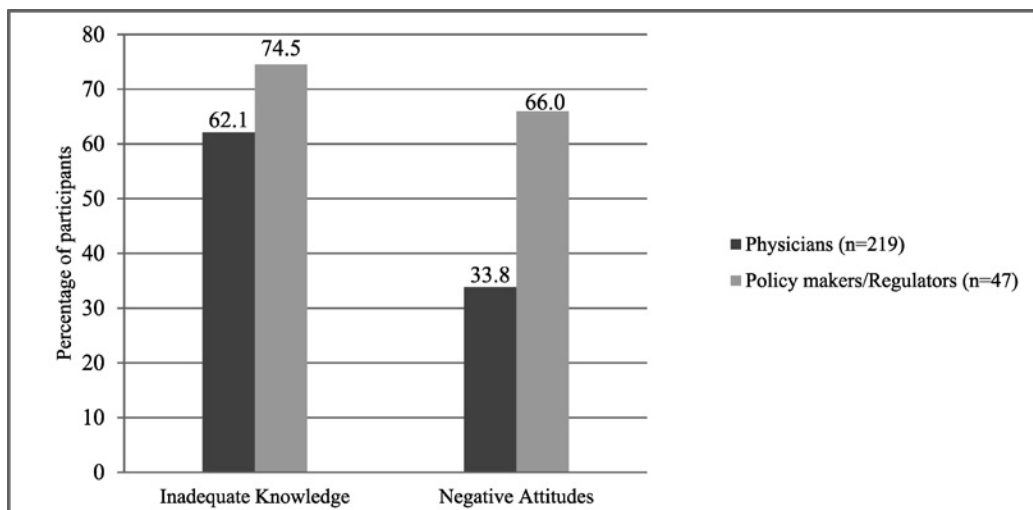


Fig. 1 Level of knowledge and attitudes of participants regarding use of opioids for cancer pain management

Table 3 Logistic regression analysis of related factors associated with inadequate knowledge regarding use of opioids for cancer pain management (CPM)

Variables	Knowledge of Physicians (n=219)				Knowledge of Policy makers/Regulators (n=47)			
	% Inadequate (n=136)	% Adequate (n=83)	OR ^a (95% CI ^b)	P value	% Inadequate (n=35)	% Adequate (n=35)	OR ^a (95% CI ^b)	P value
Gender								
Female	35.3	54.2	1 (Reference)		48.6	91.7	1 (Reference)	
Male	64.7	45.8	2.2 (1.2–3.8)	0.006	51.4	8.3	11.7 (1.4–100.2)	0.025
Age (y)								
≤ 35	55.9	41.0	1.8 (1.1–3.2)	0.033	31.4	33.3	0.9 (0.2–3.7)	0.903
≥ 36	44.1	59.0	1 (Reference)		68.6	66.7	1 (Reference)	
Last time in CPM education or training (y)								
< 1	4.4	28.9	1 (Reference)		5.7	33.3	1 (Reference)	
≥ 1	38.2	53.0	4.7 (1.8–12.6)	0.002	34.3	41.7	4.8 (0.7–35.2)	0.123
Never	57.4	18.1	20.8 (7.3–59.5)	<0.001	60.0	25.0	14.0 (1.7–112.6)	0.013
Medical specialty								
Board certificate: Oncology	1.5	13.3	1 (Reference)					
Anesthesiology	3.7	27.7	1.2 (0.2–7.2)	0.845				
Surgery	12.5	10.8	10.4 (1.9–57.4)	0.007				
Other	31.6	20.5	13.9 (2.8–69.5)	0.001				
General Practice ^c	50.7	27.7	16.5 (3.4–80.0)	0.001				
Hospital type								
Medical school hospital	0.7	7.2	1 (Reference)					
Community hospital	69.9	42.2	16.3 (1.9–140.1)	0.011				
General hospital	10.3	12.0	8.4 (0.9–81.1)	0.066				
Regional hospital	4.4	19.3	2.3 (0.2–22.8)	0.492				
Cancer center	1.5	4.8	3.0 (0.2–45.2)	0.427				
Other	13.2	14.5	9.0 (1.0–84.5)	0.054				
Number of cancer patients being cared for in the past 6 months								
≤ 10	63.2	37.3	6.8 (3.0–15.4)	<0.001				
11–30	28.7	30.1	3.8 (1.62–9.1)	0.002				
≥ 31	8.1	32.5	1 (Reference)					
Use of the World Health Organization (WHO) three-step ladder								
Yes	28.7	85.5	1 (Reference)					
No	29.4	4.8	18.2 (6.1–54.7)	<0.001				
Don't know the WHO three-step ladder	41.9	9.6	13.0 (5.6–30.0)	<0.001				
Be a member of the palliative care team								
Yes	23.5	56.6	1 (Reference)					
No	76.5	43.4	4.2 (2.4–7.6)	<0.001				

^a OR: odds ratio; ^b CI: confidence interval; ^c General Practice: Reference group is oncology.

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Table 4 Attitudes of participants regarding use of opioids for cancer pain management (CPM)

Items	Physicians (n=219)	Policy makers/ Regulators (n=47)	P value ^a
	Desirable answer N (%)	Desirable answer N (%)	
1. Only pain specialist should be responsible for the management of pain in cancer patients. ^b	202 (92.2)	14 (29.8)	<0.001
2. Use of opioids should be limited to patients with severe, intractable pain. ^b	69 (31.5)	12 (25.5)	0.419
3. Patients and their relatives should be informed that opioids are not good therefore they should put up with their pain as much as possible. ^b	182 (83.1)	32 (68.1)	0.018
4. Cancer patients should not receive opioids because of side effects. ^b	192 (87.7)	34 (72.3)	0.008
5. Cancer patients with pain no need to receive opioids because there are many other analgesics that we do not fear about diversion and abuse of opioids. ^b	113 (51.6)	22 (46.8)	0.551
6. Have a great deal of empathy for the patients with cancer pain so should provide sufficient opioids in Thailand. ^c	201 (91.8)	41 (87.2)	0.324
7. Hospital should have a stock of opioids. ^c	151 (68.9)	32 (68.1)	0.908
8. Physicians should not prescribe opioids chronically for cancer pain relief because it may have legal sanctions/legal punishment. ^b	175 (79.9)	36 (76.6)	0.611

^a P value by Chi-square test; ^b Desirable answer: “disagree” or “strongly disagree”; ^c Desirable answer: “agree” or “strongly agree”

Attitudes regarding use of opioids for CPM

The mean attitude scores of the physicians and policy makers/regulators were 5.9 ± 1.5 and 4.7 ± 2.1 , respectively. Table 4 shows that the lowest percentage of desirable answers in both groups was with the item which indicated that the use of opioids should be limited to patients with severe or intractable pain (31.5% of the physicians and 25.5% of policy makers/regulators).

Figure 1 shows that about one-third (33.8%) of physicians had negative attitudes, whereas 66.0% of policy makers/regulators had negative attitudes. Table 5 presents some background characteristics which had significant effects on attitudes of physicians, such as their medical specialty; number of cancer patients being cared for in the past six months; and use of the WHO three-step ladder the last time in CPM education or training. These characteristics also had a significant effect on policy makers/regulators.

Barriers to Opioid Availability for CPM

The barriers are demonstrated in Table 6. The lack of education and training opportunities in CPM is the greatest barrier among physicians. For policy makers/regulators, perceived shortages or interruptions in opioid manufacture or distribution were the greatest barriers.

DISCUSSION

To our knowledge, this is the first study focusing on the knowledge and attitudes of physicians and policy makers/regulators regarding use of opioids for CPM, and of their perceptions concerning barriers to opioid availability in Thailand. The main findings were that physicians and

Table 5 Logistic regression analysis of related factors associated with negative attitudes regarding use of opioids for cancer pain management (CPM)

Variables	Attitudes of Physicians (n=219)				Attitudes of Policy makers/Regulators (n=47)			
	% Negative (N=74)	% Positive (N=145)	OR ^a (95% CI ^b)	P value	% Negative (N=31)	% Positive (N=16)	OR ^a (95% CI ^b)	P value
Gender								
Female	44.6	41.4	1 (Reference)		51.6	75.0	1 (Reference)	
Male	55.4	58.6	0.9 (0.5–1.5)	0.649	48.4	25.0	2.8 (0.7–10.7)	0.128
Age (y)								
≤ 35	58.1	46.2	1.6 (0.9–2.8)	0.097	32.3	31.3	1.0 (0.3–3.8)	0.944
≥ 36	41.9	53.8	1 (Reference)		67.7	68.8	1 (Reference)	
Last time in CPM education or training (y)								
< 1	13.5	13.8	1 (Reference)		3.2	31.3	1 (Reference)	
≥ 1	31.1	50.3	0.6 (0.3–1.5)	0.310	29.0	50.0	5.6 (0.5–58.9)	0.150
Never	55.4	35.9	1.6 (0.7–3.7)	0.301	67.7	18.8	35.0 (3.0–411.5)	0.005
Medical specialty								
Board certificate: Oncology	6.8	5.5	1 (Reference)		–	–	–	–
Anesthesiology	2.7	17.9	0.1 (0.0–0.8)	0.024	–	–	–	–
Surgery	8.1	13.8	0.5 (0.1–2.0)	0.319	–	–	–	–
Other	28.4	26.9	0.9 (0.3–3.0)	0.813	–	–	–	–
General Practice ^c	54.1	35.9	1.2 (0.4–4.1)	0.733	–	–	–	–
Hospital type								
Medical school hospital	1.4	4.1	1 (Reference)		–	–	–	–
Community hospital	63.5	57.2	3.4 (0.4–29.1)	0.264	–	–	–	–
General hospital	10.8	11.0	3.0 (0.3–29.4)	0.345	–	–	–	–
Regional hospital	12.2	9.0	4.2 (0.4–40.7)	0.221	–	–	–	–
Cancer center	0.0	4.1	0.0 (0.0)	0.999	–	–	–	–
Other	12.2	14.5	2.6 (0.3–24.6)	0.412	–	–	–	–
Number of cancer patients being cared for in the past 6 months								
≤ 10	63.5	48.3	1.0 (0.5–2.2)	0.939	–	–	–	–
11–30	16.2	35.9	0.4 (0.1–0.9)	0.024	–	–	–	–
≥ 31	20.3	15.9	1 (Reference)		–	–	–	–
Use of the World Health Organization (WHO) three-step ladder								
Yes	44.6	53.1	1 (Reference)		–	–	–	–
No	28.4	15.9	2.1 (1.0–4.4)	0.039	–	–	–	–
Don't know the WHO three-step ladder	27.0	31.0	1.0 (0.5–2.0)	0.915	–	–	–	–
Be a member of the palliative care team								
Yes	32.4	37.9	1 (Reference)		–	–	–	–
No	67.6	62.1	1.3 (0.7–2.3)	0.423	–	–	–	–

^a OR: odds ratio; ^b CI: confidence interval; ^c General Practice: Reference group is oncology.

policy makers/regulators had inadequate knowledge and negative attitudes concerning the proper use of opioids, and that there exist several barriers to opioid availability.

This study showed that physicians were more knowledgeable than policy makers/regulators regarding knowledge questions about the use of opioids, except for one question about opioid regulations. In addition, policy makers/regulators had more negative attitudes than physicians in all attitude items. This may be because some policy makers are not healthcare professionals, such as the representatives from the Office of the Attorney General, the Ministry of Defense and the Royal Thai Police, and do not have background knowledge in medicine. They are more concerned about public security. The explanation for the knowledge deficit about opioid regulations among physicians is that medical school curricula rarely include instruction about opioid regulations.

The knowledge question with the most incorrect answers from both groups concerned definitions of addiction and physical dependence. This misconception was also found in a previous study in Canada (18% of physicians) and another study in the United States (almost 10% of state medical board members).^{25,26} Terminological confusion can deter physicians from using opioids, and policy makers/regulators from setting appropriate regulatory policies.²⁷ It must be noted that only 65.3% of physicians knew that morphine in an oral solution dosage form is now available at the Thai FDA. Because the physicians did not know the up-to-date information, there

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Table 6 Identified barriers to opioid availability for cancer pain management (CPM) as serious problems in Thailand

Items	Physicians (n=219)		Policy makers/ Regulators (n=47)		P value ^a
	N	(%)	N	(%)	
1. There is a lack of education and training opportunities in CPM for health care professionals.	66	(30.1)	19	(40.4)	0.170
2. There is a lack of education about CPM for health policy makers and drug regulators.	64	(29.2)	16	(34.0)	0.513
3. Hospital pharmacy stocks insufficient opioid analgesics.	55	(25.1)	16	(34.0)	0.209
4. Shortages or interruptions in opioid manufacture or distribution periodically.	52	(23.7)	28	(59.6)	<0.001
5. There is a lack of communication about the need for opioids for cancer pain between key groups including health care professionals, health policy makers, drug regulators, and drug manufacturers.	39	(17.8)	25	(53.2)	<0.001
6. Key decision makers are overly concerned about drug abuse, addiction, or diversion.	36	(16.4)	14	(29.8)	0.034
7. Opioids are available but not in the needed dosage forms.	35	(16.0)	12	(25.5)	0.119
8. Opioids are available but not the needed right ones.	32	(14.6)	14	(29.8)	0.013
9. Hospital director is overly concerned about drug abuse and diversion.	28	(12.8)	14	(29.8)	0.004
10. Opioid analgesic products are too expensive.	28	(12.8)	8	(17.0)	0.441
11. Physician has excessive concern about addiction and side effects of opioids.	27	(12.3)	15	(31.9)	0.001
12. There is a lack of regulatory provision made for emergency prescription of opioids for patients with an urgent need for relief of severe pain when a physician may not be able to attend to them.	22	(10.0)	10	(21.3)	0.032

^a P value by Chi-square test

was a missed opportunity to treat some cancer patients who needed the morphine oral solution.

Many physicians in this study displayed significantly inadequate knowledge toward opioid pharmacology compared with physicians in the United States, whereas the results of this study were not much different from those of other Asian countries. For example, 57.1% of physicians in this study and 31% of South Korean physicians answered correctly that there is no ceiling effect for opioids, while 87% of physicians in the State of New Hampshire and 99% of physicians in the State of Minnesota answered correctly.^{14,28,29)} Additionally, 49.8% of physicians in this study and 66.2% of Taiwanese physicians did not know that the oral route is efficacious.¹⁵⁾ We can point out that some Asian countries still have inadequate medical education regarding the use of opioids; furthermore, Thailand has only a few pain clinics available where medical students can practice.

For the attitudes about opioid abuse and diversion, 32% of state medical board members in the United States in 2004 considered this issue as a serious problem, whereas 53.2% of policy makers/regulators in our study were concerned about it. Realizing that the narcotics problem has become one of the most serious problems in Thailand, policy makers/regulators in our country are now very concerned about this issue. In addition, physicians in this study avoided prescribing opioids because of the fear of diversion or abuse. In 2000, the WHO, in cooperation with the International Narcotics Control Board (INCB), recommended the concept of balance, meaning

that laws and regulations should be sufficient for preventing diversion and trafficking, but that they should not compromise access to opioids for genuine medical need.³⁰⁾

A great number of policy makers/regulators (70.2%) considered that only a pain specialist should be responsible for the management of pain in cancer patients, in contrast with physicians (7.8%). Unfortunately, Thailand has only a few pain specialists available. The great majority of cancer pain patients are treated by their physician in charge, who usually relies on a general practitioner.¹⁹⁾ Hence, it seems to be that physicians understand this situation more than policy makers/regulators. We also found that GPs were more likely to have inadequate knowledge and negative attitudes than physicians in other specialties. The significant effect of medical specialty on attitudes and knowledge about CPM was reported by various other studies.^{12,15,28)} Our results revealed that oncologists appeared more knowledgeable in comparison to others; however, there was no statistical difference between anesthesiologists and oncologists. On the other hand, anesthesiologists showed significantly more positive attitudes than oncologists. The explanation for these findings could be that both anesthesiologists and oncologists take care of many cancer patients. However, anesthesiologists focus on cancer pain while oncologists focus on tumor treatment.

Furthermore, this study found that patient volume was another variable that affected physicians' knowledge. This result was similar to that of the previous study in Taiwan in which physicians who treated more cancer patients were more likely to have adequate knowledge.¹⁵⁾ We also reasoned that physicians who worked in community hospitals were more likely to have inadequate knowledge than physicians in other types of hospitals, because their hospitals usually have fewer cancer patients.

We found that physicians who had received education or training more recently were more likely to have adequate knowledge. Yun *et al.* indicated that physicians who had received CPM training more recently were more likely to prescribe morphine for severe cancer pain.²³⁾ Hence, it is necessary to update their knowledge. Interestingly, the physicians who did not use the WHO three-step ladder were more likely to have inadequate knowledge and negative attitudes. Kim *et al.* illustrated that the real usage of the WHO three-step ladder can help in obtaining better and more adequate CPM results.²⁸⁾ Being a member of a palliative care team was significantly associated with inadequate knowledge but was not significantly associated with negative attitudes. Palliative care team physicians were less likely to have inadequate knowledge. A previous study showed that hospital palliative care teams can positively influence the knowledge and attitudes of physicians towards the use of opioids for CPM.³¹⁾

Identifying barriers is crucial in the initial step to improve opioid availability. Our study revealed that the lack of education and training opportunities in CPM for health care professionals is the greatest barrier among physicians. About half of the physicians in our study were GPs who worked mainly in community hospitals, and therefore desired to obtain better CPM training opportunities. Policy makers/regulators considered that shortages or interruptions in opioid manufacture or distribution were the greatest barriers. The barriers differ among countries. For example, the inadequate availability of oral opioids was reported as a significant barrier in Serbia, and the complicated regulations and problems related to attitudes and knowledge regarding opioids for pain relief among professionals and the public were the major barriers in India.^{32,33)}

This study had some limitations. First, the sample size of the policy makers/regulators was too small. Therefore, other narcotics subcommittees should be included in future research. The second limitation was the selection bias that we created by allowing the director of each hospital to select which physician responds to the questionnaire.

In conclusion, this study suggests that there are inadequate knowledge and negative attitudes among physicians and policy makers/regulators regarding the use of opioids for CPM in Thailand.

Continuing education for physicians and setting up conferences for policy makers/regulators are needed. Special education and training should be addressed to clarify the terms “physical dependence” and “addiction.” Basic knowledge updates regarding opioid pharmacology and narcotics laws are also needed, especially for physicians working in community hospitals. Their negative attitudes should be corrected. Cooperation among key cancer treatment stakeholders in overcoming the opioid availability barriers is also needed.

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