

# Knowledge, attitudes and beliefs about chronic noncancer pain in primary care: A Canadian survey of physicians and pharmacists

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**BACKGROUND:** Primary care providers' knowledge, attitudes and beliefs (KAB) regarding chronic noncancer pain (CNCP) are a barrier to optimal management.

**OBJECTIVES:** To evaluate and identify the determinants of the KAB of primary care physicians and pharmacists, and to document clinician preferences regarding the content and format of a continuing education program (CEP).

**METHOD:** Physicians and pharmacists of 486 CNCP patients participated. Physicians completed the original version of the KnowPain-50 questionnaire. Pharmacists completed a modified version. A multivariate linear regression model was developed to identify the determinants of their KAB.

**RESULTS:** A total of 137 of 387 (35.4%) physicians and 110 of 278 (39.5%) pharmacists completed the survey. Compared with the physicians, the pharmacists surveyed included more women (64% versus 38%) and had less clinical experience (15 years versus 26 years). The mean KnowPain-50 score was 69.3% (95% CI 68.0% to 70.5%) for physicians and 63.8% (95% CI 62.5% to 65.1%) for pharmacists. Low scores were observed on all aspects of pain management: initial assessment (physicians, 68.3%; pharmacists, 65.4%); definition of treatment goals and expectations (76.1%; 61.6%); development of a treatment plan (66.4%; 59.0%); and reassessment and management of longitudinal care (64.3%; 53.1%). Ten hours of reported CEP sessions increased the KAB score by 0.3 points. All clinicians considered a CEP for CNCP to be essential. Physicians preferred an interactive format, while pharmacists had no clear preferences.

**CONCLUSION:** A CEP to improve primary care providers' knowledge and competency in managing CNCP, and to reduce false beliefs and inappropriate attitudes regarding CNCP is relevant and perceived as necessary by clinicians.

**Key Words:** Beliefs; Chronic noncancer pain; Knowledge; Physicians and pharmacists; Primary care

Chronic noncancer pain (CNCP) is defined as pain that persists for >6 months (1). In Canada, as in other industrialized countries, approximately 20% of the population experiences CNCP (2-5). Its prevalence is constantly increasing as the population ages (2,3,6). CNCP is associated with major psychosocial distress for affected

Les connaissances, les attitudes et les croyances sur les douleurs chroniques non cancéreuses en première ligne : un sondage canadien auprès des médecins et des pharmaciens

**HISTORIQUES :** Les connaissances, les attitudes et les croyances (CAC) des dispensateurs de soins de première ligne envers les douleurs chroniques non cancéreuses (DCNC) font obstacle à une prise en charge optimale.

**OBJECTIFS :** Évaluer et établir les déterminants des CAC des médecins et pharmaciens de première ligne et étayer les préférences cliniques relatives au contenu et à la structure d'un programme de perfectionnement professionnel continu (PPC).

**MÉTHODOLOGIE :** Les médecins et les pharmaciens de 486 patients ayant des DCNC ont participé à l'étude. Les médecins ont rempli la version originale du questionnaire KnowPain-50, tandis que les pharmaciens en ont utilisé une version modifiée. Les chercheurs ont préparé un modèle de régression linéaire multivariée pour établir les déterminants de leurs CAC.

**RÉSULTATS :** Au total, 137 des 387 médecins (35,4 %) et 110 des 278 pharmaciens (39,5 %) ont rempli le sondage. Par rapport aux médecins, les pharmaciens sondés comprenaient davantage de femmes (64 % comparativement à 38 %) et avaient moins d'expérience clinique (15 ans comparativement à 26 ans). L'indice moyen du questionnaire KnowPain-50 s'établissait à 69,3 % (95 % IC 68,0 % à 70,5 %) pour les médecins et à 63,8 % (95 % IC 62,5 % à 65,1 %) pour les pharmaciens. Tous les aspects de la gestion de la douleur ont donné des indices faibles : évaluation initiale (médecins, 68,3 %; pharmaciens, 65,4 %), définition des objectifs et attentes thérapeutiques (76,1 %; 61,6 %), élaboration d'un plan thérapeutique (66,4 %; 59,0 %) et réévaluation et prise en charge des soins longitudinaux (64,3 %; 53,1 %). Des séances de PPC d'une durée de dix heures amélioreraient l'indice de CAC de 0,3 point. Tous les cliniciens jugeaient essentielle la tenue d'un PPC sur les DCNC. Les médecins préféraient une structure interactive, tandis que les pharmaciens n'avaient pas de préférences claires.

**CONCLUSION :** Il est pertinent de préparer un PPC pour améliorer les connaissances et les compétences des dispensateurs de soins de première ligne envers les DCNC et pour réduire les croyances erronées et les attitudes inadéquates au sujet des DCNC, et les cliniciens le perçoivent comme nécessaire.

individuals and their relatives, and with a heavy economic burden for society as a whole (6-9).

Current management of CNCP is often associated with suboptimal clinical outcomes in terms of pain relief and health-related quality of life (7,10), particularly in primary care, where most of these patients

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are followed (5,10-15). In the United States, it has been estimated that >40% of patients with chronic pain experience uncontrolled pain (16). In a Canadian survey (7), a large proportion of patients taking prescribed analgesics reported high levels of pain interference with day-to-day activities (37% of all patients with pain and 59% of those reporting severe pain). In this population, the prevalence of depression and anxiety (4,6) as well as sleep problems (5) is high. In fact, primary care clinicians themselves believe that more than one-half of their patients are not receiving optimal treatment (15,17). Moreover, the therapeutic gaps between recommended and actual pain treatment may be contributing to increase the incidence of chronic pain (7).

Several studies have suggested that suboptimal clinical care may be due, in part, to deficient knowledge, false beliefs and inappropriate attitudes among clinicians regarding pain and its treatment (10-15). The main barriers to optimal treatment reported by clinicians were side effects (cited by 74% of respondents), patient compliance (58%), and concerns about the efficacy of available therapies (60%) (15). With respect to opioid treatment, the barriers to optimal pain management most frequently mentioned by primary care physicians were fear of opioid dependency and of significant side effects, and the potential for misuse and abuse (7,13,17-19). These considerations may explain why 52% of physicians said they systematically have their patients evaluated by a specialist before prescribing opioids (20). Pharmacists are also reluctant to dispense opioids; 58.3% believe that CNCP patients are liable to develop addiction (14). A continuing education program (CEP) may be an important factor in improving treatment outcomes. However, to develop programs that target the needs and preferences of clinicians, a better understanding of their knowledge, attitudes and beliefs (KAB) about pain and its treatment is essential.

As part of the ACCORD Program (*Application Concertée des Connaissances et Ressources en Douleur*), a knowledge-translation research program on CNCP, a cohort study was conducted to describe the management of CNCP patients in primary care (21). A total of 486 patients with moderate to severe CNCP were recruited in community pharmacies located in urban and semiurban areas (22,23). Considerable proportions of the patients had probable depression (23.9%) and anxiety (39.9%). The prevalence of analgesic side effects was as high as 95.5%, and these were often left untreated. Patient satisfaction with treatment was low, particularly with regard to information about pain and its treatment. For patients, the greatest barriers to optimal management included fatalistic beliefs and fear of the harmful effects of pain medicine in general.

The current report presents the results of a cross-sectional survey of primary care physicians and pharmacists involved in following the ACCORD cohort patients. It was conducted to evaluate their KAB about pain and its treatment, identify the determinants of better KAB and document their preferences regarding the content and format of a CEP.

## METHODS

The ACCORD Program is funded by the Canadian Institutes of Health Research through the Community Alliances for Health Research and Knowledge Exchange on Pain. It comprises five axes of research: geoepidemiology, primary care, nursing home, patient self-management and pain awareness/education program (21). Within the primary care axis, a cohort of 486 CNCP patients was formed. The primary care physicians and pharmacists of these patients were asked to complete a self-administered questionnaire to assess KAB regarding pain and its treatment. Ethical approval was obtained from the Scientific and Ethics Research Committee of the *Centre de santé et de services sociaux de Laval*, Laval, Quebec. All participants signed a consent form and received financial compensation (\$25).

### Participants

Consultation of the provincial health ministry atlas (24) yielded a total of 513 pharmacies in the territory of the Integrated University Health Network of the Université de Montréal in six health and social services regions: Mauricie and Centre du Québec, Laval, Montréal, Laurentides, Lanaudière and Montérégie. Based on this sampling frame, a random

sampling, stratified according to region and weighted according to the number of pharmacies within each region, was performed to recruit a total of 60 pharmacies. The owners were contacted and invited to participate. Pharmacies in each region were approached until the target was reached. To recruit 600 patients, every participating pharmacy was asked to identify between 10 and 15 consecutive, potentially eligible patients. The criteria for patient eligibility were: age  $\geq 18$  years; experiencing CNCP, defined as pain lasting for  $\geq 6$  months and not related to cancer; reporting an average pain intensity in the past seven days of at least 4 on a 0 to 10 scale, where 0 represents 'no pain' and 10 represents 'the worst possible pain'; experiencing pain at least two days per week; having an active analgesic prescription from a primary care physician; and able to speak and read French or English. Patients who had migraine as the sole cause of pain were excluded, as were those with any health problem that might prevent them from providing informed consent. To compensate for pharmacies that did not recruit the expected number of patients, additional pharmacies were invited to participate during the course of the study.

From May to October 2009, 296 community pharmacies were randomly selected and invited to participate; of these, 84 (28.4%) were recruited, representing 278 pharmacists. At the time of recruitment, all participating pharmacists were asked to complete the survey, and the questionnaire was sent to those who agreed. To increase the response rate, they received a telephone call every two weeks for two months or until the questionnaire was returned. Participating pharmacists recruited a total of 486 CNCP cohort patients.

Using their pharmacy dispensing chart for each cohort patient, pharmacists identified a primary care physician prescriber of an active analgesic prescription including acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), anticonvulsants, antidepressants, muscle relaxants and opioids. Each of these physicians was asked to complete a self-administered questionnaire. A modified version of Dillman's Tailored Design Method (25) was used from January to March 2010. The physicians first received a personalized letter of invitation describing the study. One week later, they received a self-administered questionnaire, an informed consent form and a postage-paid return envelope. Two weeks later, they received a postcard to remind them to complete and return the questionnaire. Three weeks later, nonrespondents were sent the questionnaire again. Two weeks after that, nonrespondents were mailed the questionnaire a third time.

### Survey

The questionnaire was written in French. It comprised 15 pages for pharmacists and 16 pages for physicians, including a cover page and an instruction page. It was divided into three sections addressing KAB regarding pain and its treatment, sociodemographic information and previous training, and needs and preferences for a CEP.

The KnowPain-50 questionnaire was developed by pain physicians to measure the KAB of physicians regarding chronic pain and its treatment (12). It comprises 50 items divided into six subscales: initial pain assessment (13 items); defining goals and expectations (10 items); development of a treatment plan (16 items); implementation of a treatment plan (three items); reassessment and management of longitudinal care (one item); and management of environmental issues (seven items). The questionnaire includes 45 Likert-scale questions and five multiple-choice questions. For each Likert-scale question, respondents can be awarded a score ranging from 0 (incorrect answer/strongly agree) to 5 (correct answer/strongly disagree) depending on their level of agreement with each statement. The response scales for 20 items (questions 6, 8, 16-18, 21, 23, 26-34, 37, 43, 44 and 46) are inverted (scores of 5, 4, 3, 2, 1 and 0 transformed into a score of 0, 1, 2, 3, 4 and 5, respectively). For multiple-choice questions, correct answers receive five points. Overall and subscale scores are expressed as the sum of the individual scores (absolute score) and as a percentage score (absolute score/maximum possible score  $\times 100\%$ ). The range for total overall absolute scores is 0 to 250 (a higher score indicating better knowledge). In one study (12), the Cronbach alpha reliability index was high in three different populations of physicians (0.77 to 0.85);

**TABLE 1**  
**Cronbach alpha reliability coefficients of the KnowPain-50 subscales and overall scale**

Subscale	Pharmacists (n=110)		Physicians (n=137)	
	Items, n	Cronbach alpha (95% CI)	Items, n	Cronbach alpha (95% CI)
Initial pain assessment	8	0.50 (0.34 to 0.63)	13	0.53 (0.40 to 0.64)
Defining goals and expectations	9	0.20 (-0.05 to 0.41)	10	0.46 (0.31 to 0.59)
Development of a treatment plan	15	0.55 (0.41 to 0.67)	16	0.64 (0.54 to 0.73)
Implementation of a treatment plan	3	0.25 (-0.03 to 0.46)	3	0.22 (-0.04 to 0.42)
Reassessment and management of longitudinal care	1	—	1	—
Management of environmental issues	7	0.24 (0.00 to 0.44)	7	0.61 (0.51 to 0.71)
Pharmacotherapy	7	-0.03 (-0.37 to 0.25)	7	0.03 (-0.25 to 0.27)
Original overall scale	43	0.66 (0.55 to 0.75)	50	0.77 (0.71 to 0.83)
Modified overall scale*	50	0.64 (0.53 to 0.74)	50	0.77 (0.71 to 0.83)

\*The modified overall scale includes 43 questions from the original scale plus seven questions developed by a panel of experts to specifically assess the knowledge, attitudes and beliefs of pharmacists. Refer to the methods section for more information

the overall score correlated with clinical behaviour and appeared to distinguish between physicians who had participated in different pain management education programs. In another study (26), Knowpain-50 was responsive to education interventions. The original English version was translated into French using a forward-backward translation process (27). The French version is available on request.

A panel of experts, including three pharmacists, one primary care physician with expertise in chronic pain management and one geriatrician, assessed the relevance of the KnowPain-50 questionnaire for evaluating the KAB of pharmacists. By consensus of the panel, seven items were considered to be inappropriate in the following subscales: initial pain assessment (questions 1, 15, 17, 18 and 38); defining goals and expectations (question 23); and development of a treatment plan (question 43). One panel member (a hospital pharmacist with expertise in chronic pain management) proposed an initial set of 10 multiple-choice questions on the pharmacotherapy of CNCP. By consensus of all members of the panel, seven of these questions were selected and modified when deemed appropriate: recommendations regarding initial treatment of CNCP; management of constipation in patients taking opioids; recommendation regarding use of NSAIDs; recommendation regarding use of acetaminophen versus NSAIDs; opioid dosage conversion; treatment of fibromyalgia; and adverse effects of tricyclic antidepressants in elderly patients. Each correct answer would receive a score of 5. Physicians completed the original 50-item questionnaire along with these seven additional items (total of 57 items). Pharmacists completed only the modified questionnaire including the 43 original items and the seven additional items (total of 50 items).

Three questions were used to evaluate the clinicians' perceived learning needs and their preferences regarding the format and content for a CEP. Clinicians were asked: "From your standpoint, is there a need for a CEP in CNCP for primary care physicians (or pharmacists)?" (Yes/No). Preferences regarding the optimal format for such a program were elicited by asking respondents: "What would be the best educational vehicle(s) or method(s) for a CEP?" Participants could check off one or more of the listed items and add their own suggestions as well. To elicit their recommendations regarding the content of the program, they were asked: "In which area(s) would you like to have more training with regard to CNCP?" Once again, they could check off one or more listed items and add their own suggestions. Items were predefined by our panel of experts. They identified topics of interest for both physicians and pharmacists (treatment guidelines and pharmacotherapy) as well as topics specifically for physicians (eg, assessment, follow-up, diagnosis, methods of treatment) and others for pharmacists (eg, detection and management of drug-related problems and side effects, and collaborative practices with physicians).

#### Statistical analyses

The response rate was assessed for physicians and pharmacists. Their characteristics were described using proportions and means  $\pm$  SD. For

physicians, the overall original KnowPain-50 score (including the original 50 items) and the modified score (including the original 43 items plus the seven new items) were computed. For pharmacists, the overall original score (including the original 43 items) and the overall modified score (including the original 43 items plus the seven new items) were computed. Subscale and overall scores were calculated when at least 90% of the questions were answered. Missing data were replaced by the respondent's mean score calculated using the available results. A sensitivity analysis was performed by replacing missing responses by a score of zero. The mean  $\pm$  SD absolute overall and subscale scores and their 95% CIs were computed for pharmacists and physicians. The Cronbach alpha reliability coefficients (95% CI) for the original and modified versions were computed for each subscale and the overall scale.

A multivariate linear regression model was developed to identify the determinants of higher overall absolute KnowPain-50 scores based on the original scale for physicians (50 questions) and the modified scale for pharmacists (50 questions). The independent variables in the models included type of clinician (physician/pharmacist), sex, years since graduation and hours of reported CEP sessions in chronic pain in the past five years. A type 1 error of 0.05 was used as the threshold of statistical significance.

Univariate logistic models were used to assess the likelihood of clinicians' identifying a need for more training in a specific area (dependent variable) as a function of scores on the KnowPain-50 subscales and the new pharmacotherapy subscale (independent variables). Statistical analyses were performed using SPSS version 19.0 (IBM Corporation, USA) for Windows (Microsoft Corporation, USA), and SAS version 9.1 (SAS Inc, USA).

## RESULTS

A total of 278 community pharmacists were recruited in the ACCORD cohort study and asked to complete the survey; 129 agreed and 110 (39.6%) returned their completed questionnaire. The pharmacists identified a total of 486 eligible CNCP patients, who were followed by 387 primary care physicians. These physicians were asked to complete the survey; 137 (35.4%) returned their completed questionnaire. For two respondents, the overall KnowPain-50 score could not be calculated because they left >10% of the questions unanswered.

As reported in Table 1, the Cronbach alpha reliability coefficients for the original and modified versions of the KnowPain-50 questionnaire were similar for both pharmacists (original [based on 43 items]: 0.66; modified [50 items]: 0.64) and physicians (original [50 items]: 0.77; modified [50 items]: 0.77). The coefficients were lower for pharmacists (eg, 0.66 for pharmacists versus 0.77 for physicians on the original overall scale); however, given the overlapping of the 95% CI (pharmacists, 0.55 to 0.75; physicians, 0.71 to 0.83), the differences were not statistically significant. The subscale coefficients varied from -0.03 to 0.55 for pharmacists and from 0.03 to 0.64 for physicians; they were particularly low for the 'Pharmacotherapy' subscale.

**TABLE 2**  
**Characteristics of the primary care physicians, pharmacists and pharmacies who participated in the present study**

Characteristics of clinicians	Pharmacists (n=110)*	Physicians (n=137)*
Sex		
Male/female	40 (36.4)/70 (63.6)	84 (61.8)/52 (38.2)
Year of graduation		
≥2001	36 (32.7)	4 (2.9)
1991–2000	36 (32.7)	17 (12.4)
≤1990	38 (34.5)	114 (83.2)
Time since Quebec practice license obtained, years, mean ± SD	15±10	26±9
Other university degree		
Yes	23 (20.9)	34 (24.8)
Bachelors	13 (11.8)	28 (20.4)
Masters	10 (9.1)	6 (4.4)
Exposure to continuing education program on chronic pain in past five years	47 (42.7)	115 (83.9)
If yes, time spent in continuing education on chronic pain in past five years, h, mean ± SD	23.1±41.6	44.6±84.7
Type of pharmacist		
Owner pharmacist/salaried pharmacist	43 (39.1)/67 (60.9)	
<b>Characteristics of pharmacies (n=62)</b>		
Type of pharmacy		
Chain and banner/independent	60 (96.8)/2 (3.2)	
Surface area, square feet		
<1000	9 (15.0)	
1000–2499	11 (18.3)	
2500–4999	12 (20.0)	
≥5000	28 (46.7)	
Opening hours per week, h, mean ± SD	75.4±14	
Opening hours per week, pharmacist hours, mean ± SD	88.3±27	
Area available for private consultations		
Yes/no	61 (98.4)/1 (1.6)	

Data presented as n (%) unless otherwise indicated. \*Missing data if total number of respondents is lower than the total number of participants.

**TABLE 3**  
**Knowledge, attitudes and beliefs of primary care physicians and pharmacists regarding chronic noncancer pain and its treatment as evaluated with the KnowPain-50 questionnaire**

	Pharmacists (n=110)				Physicians (n=137)			
	Items, n	Absolute score, mean ± SD	Percentage point score		Items, n	Absolute score, mean ± SD	Percentage point score	
			Mean ± SD	95% CI			Mean ± SD	95% CI
Subscale scores								
Initial pain assessment	8	26.2±4.2	65.4±10.6	63.4–67.5	13	44.4±5.9	68.3±9.0	66.7–69.8
Defining goals and expectations	9	27.7±4.3	61.6±9.5	59.8–63.4	10	38.0±4.4	76.1±8.8	74.6–77.6
Development of a treatment plan	15	44.2±7.8	59.0±10.4	57.0–61.0	16	53.1±8.4	66.4±10.5	64.6–68.2
Implementation of a treatment plan	3	11.0±3.0	73.1±20.1	69.3–77.0	3	11.7±2.1	78.0±14.0	75.7–80.4
Reassessment and management of longitudinal care	1	2.7±1.3	53.1±26.9	48.0–58.2	1	3.2±1.2	64.3±23.8	60.2–68.3
Management of environmental issues	7	22.6±4.1	64.4±11.8	62.2–66.7	7	22.6±4.9	64.8±14.0	62.3–67.1
Pharmacotherapy	7	25.6±6.1	73.0±17.3	69.6–76.5	7	25.2±6.9	71.9±19.6	68.4–75.3
Original overall score	43	134.3±14.5	62.5±6.8	61.2–63.8	50	172.1±18.6	69.4±7.6	68.2–70.7
Modified overall score	50	159.5±17.4	63.8±7.0	62.5–65.1	50	173.2±18.3	69.3±7.3	68.0–70.5

Table 2 shows that the pharmacists were mainly women (63.6%), having graduated a mean of 15 years previously. Forty-three percent of pharmacists had attended a CEP on chronic pain in the previous five years. Because all the surveyed pharmacists were participants in the ACCORD cohort study, it was possible to compare pharmacists who completed the survey with those who did not in terms of sex, type (owner or salaried) and pharmacy characteristics (type, size, number of business hours, availability of a private consultation area); no significant differences were found. Physicians were mainly men (61.8%) and had a mean of 26 years' experience since graduation. Most (83.9%) had attended a CEP about chronic pain in the previous five years. No

data were available regarding physicians who did not complete the survey.

As reported in Table 3, the original overall unadjusted mean scores on the KnowPain-50 questionnaire were 62.5% (95% CI 61.2% to 63.8%) for pharmacists and 69.4% (95% CI 68.2% to 70.7%) for physicians. Similar results were obtained with the modified version of the questionnaire (pharmacists, 63.8% [95% CI 62.5% to 65.1%]; physicians, 69.3% [95% CI 68.0% to 70.5%]). Replacing missing responses by a score of zero did not substantially change the results. The highest mean subscale scores for both pharmacists and physicians were on 'Implementation of a treatment plan' (pharmacists, 73.1%; physicians,

78.0%) and 'Pharmacotherapy' (pharmacists, 73.0%; physicians, 71.9%). These scales involve general notions of the pharmacotherapy of chronic pain and the management of analgesic side effects. Scores were lower on the subscales dealing with specific patient populations (eg, the elderly or those at risk of addiction) and a specific type of pain (eg, neuropathic pain): 'Initial pain assessment' (pharmacists, 65.4%; physicians, 68.3%), 'Defining goals and expectations' (61.6%; 76.1%), 'Development of a treatment plan' (59.0%; 66.4%) and 'Reassessment and management of longitudinal care' (53.1%; 64.3%). Finally, the scores on the 'Management of environmental issues' scale, evaluating knowledge regarding the legislation on opioid prescription, were also low (64.4%; 64.8%).

The results for individual KnowPain-50 questions are reported in Table 4. On the 'Initial pain assessment' subscale, the proportion of respondents scoring 4 or 5 (with 5 awarded for the most appropriate answer) was particularly low on questions related to the evaluation of pain. Twelve pharmacists (10.9%) and 20 physicians (14.6%) appropriately agreed that 'Patients may sleep in spite of severe pain' (question 28). A minority considered that, although patients can be distracted from their pain, its intensity may nonetheless be high (question 35; pharmacists, 32.7%; physicians, 40.9%). Overall, 36.4% of pharmacists and 56.2% of physicians believed that changes in vital signs are not reliable indicators of pain severity (question 45). On the 'Defining goals and expectations' subscale, 18 (16.4%) pharmacists and 60 (43.8%) physicians agreed that there is good evidence that psychosocial factors predict outcomes from back surgery better than the patient's physical characteristics (question 26). When considering chronic daily pain that has persisted unchanged for years (question 32), 19.1% of pharmacists and 56.2% of physicians acknowledged that such pain is unlikely to have a clear cause or cure. A minority of clinicians correctly answered questions related to the use of anticonvulsants (questions 3 and 40), antidepressants (question 24), adjuvant therapy in general (question 42), and opioids (questions 41, 48 and 49). Some questions related to 'Management of environmental issues' were correctly answered by only a small proportion of pharmacists and physicians, including question 14, regarding methadone prescription for pain (pharmacists, 38.2%; physicians, 24.8%), and question 50, regarding the number of doses of opioids that can be prescribed at one time (pharmacists, 54.5%; physicians, 52.6%).

Controlling for type of clinician (physician versus pharmacist), hours of reported CEP training were positively associated with better performance on the KnowPain-50 questionnaire: 10 h of training raised the mean overall score by 0.3 points (95% CI 0.01 to 0.8). Sex and years of practice did not affect the overall score.

As presented in Table 5, all physicians and pharmacists acknowledged their need for additional CEP on CNCP. A majority of physicians (65.4%) preferred interactive activities, such as problem-based learning. Pharmacists had no clear preferences; approximately equal proportions chose interactive activities (47.7%), self-learning modules (46.8%) and scientific presentations by peers (41.3%). Nearly one-third of the physicians and pharmacists would appreciate a training day in a pain clinic. Most pharmacists would appreciate training about treatment-guideline recommendations (77.1%) and the use of anti-convulsants (64.2%), antidepressants (61.5%), opioids (60.6%) and anti-inflammatories (48.6%). Training to improve specific skills and knowledge for the follow-up of CNCP patients garnered less support: detection and management of drug-related problems, 56.0%; pharmaceutical care with analgesic dose adjustment, 54.1%; non-pharmacological treatment, 53.2%; and detection and management of analgesic side effects, 39.4%. For physicians, the most relevant topic was the differential diagnosis of chronic pain syndromes (71.3%). More than 40% reported that they would also like training in injection-type intervention techniques (44.9%) and the indications and referral procedures for pain clinics (40.4%). Approximately one-third of physicians would like training on pain assessment and on physical and psychological follow-up for CNCP patients.

Logistic regression was used to assess correlations between the subscale and overall scores on the KnowPain-50 questionnaire and the expressed need for additional training in specific areas. Physicians with a higher score on the 'Defining goals and expectations' subscale were more likely to express a need for additional training regarding 'Indications and procedures for referring patients to multidisciplinary pain-management clinic' (OR 1.04 [95% CI 1.00 to 1.08]) and 'Psychological assessment of patient' (OR 1.05 [95% CI 1.00 to 1.10]). Pharmacists scoring higher on the 'Initial pain assessment' subscale were more likely to express interest in additional training on 'Detection and management of drug-related problems' (OR 1.05 [95% CI 1.00 to 1.09]). No other statistically significant correlations emerged.

## DISCUSSION

A survey of primary care physicians and pharmacists actively involved in the follow-up of patients with moderate to severe CNCP revealed that CEPs on chronic pain management are relevant and perceived as necessary by all clinicians. Physicians' and pharmacists' knowledge of the general notions of chronic pain pharmacotherapy and the management of analgesic side effects was relatively good. However, deficiencies were observed in all aspects of CNCP management for specific patient populations (eg, the elderly and those at risk of addiction) and specific types of pain (eg, neuropathic pain). Based on the self-reported number of CEP sessions on chronic pain in the previous five years, KAB scores rose only slightly with more training. Pharmacists did not express clear preferences regarding the format of such a CEP, while physicians preferred an interactive format.

The KnowPain-50 questionnaire is one of the most thoroughly studied physician pain KAB survey tools available for general use. However, information on its psychometric properties is limited, and the questionnaire had to be adapted for community pharmacists. To our knowledge, there is no questionnaire available to measure pain KAB across professional groups (28-30). Based on our survey results, the internal consistency coefficients of the overall original scale (95% CI of the Cronbach's alpha coefficients: pharmacists, 0.55 to 0.75; physicians, 0.71 to 0.83) and the overall modified scales (pharmacists, 0.53 to 0.74; physicians, 0.71 to 0.83) are similar to those presented by Harris et al (12) for physicians. The authors reported coefficients varying from 0.77 to 0.85 in various physician populations, including subscribers to continuing medical education website activities, pain experts and academics. In our study, the internal consistency of each subscale was quite low, ranging from -0.03 to 0.55 for pharmacists and from 0.03 to 0.64 for physicians. These results suggest that subscale scores should not be used to discriminate between groups of clinicians or detect changes over time (31). Indeed, Harris et al (12,26) used the overall score for these purposes and never reported subscale scores.

When we asked clinicians, "In which area(s) would you like to have more training with regard to CNCP?", most of the topics of interest suggested to them were specific to either pharmacists or physicians. Ideally, we should have offered the same choices to all respondents. Despite this limitation, some interesting results emerge.

In our survey, both physicians and pharmacists exhibited deficient knowledge regarding legislative rules governing opioid prescription. Similar results have been reported in a few other surveys (32-34); in still others, the burden of regulatory oversight has not been found to be a barrier to prescribing, as opposed to concerns regarding addiction (17-19,35). When asked about their needs and preferences for additional CEP sessions, no clinicians brought up the environmental issues surrounding opioid prescription as a possible topic. This may suggest that although information on these matters is needed, clinicians may not consider it crucial.

Primary care clinicians typically encounter patients with various pain disorders. Existing guidelines are not adapted to this reality and focus on specific disorders, such as neuropathic pain (36-38), low-back pain (39) and osteoarthritis (40), as well as on opioid use (41). Several

**TABLE 4**  
**Knowledge, attitudes and beliefs of primary care physicians and pharmacists as evaluated by individual KnowPain-50 questionnaire items**

		Item score*					
		Pharmacists (n=110)			Physicians (n=137)		
		0 to 1	2 to 3	4 to 5	0 to 1	2 to 3	4 to 5
<b>Initial pain assessment</b>							
Q1	A 33-year-old woman complains of "all over" pain with an intensity rating ranging from 4 to 8 on the 0 to 10 scale, fatigue, forgetfulness, poor sleep, headaches and dizziness. This symptom complex is most consistent with which of the following? <sup>†‡</sup> Correct answer: Fibromyalgia syndrome	–	–	–	35 (25.5)	–	100 (73.0)
Q7	When I see consistently high scores on pain rating scales in the face of minimal or moderate pathology, this means that the patient is exaggerating their pain. Correct answer: Strongly disagree	2 (1.8)	22 (20)	86 (78.2)	8 (5.8)	42 (30.7)	87 (63.5)
Q11	Pain complaints and degree of disability always correlate well in patients with chronic pain. Correct answer: Strongly disagree	11 (10)	31 (28.2)	67 (60.9)	12 (8.8)	28 (20.4)	96 (70.1)
Q13	A placebo can be used to determine if pain is real. Correct answer: Strongly disagree	24 (21.8)	41 (37.3)	44 (40)	10 (7.3)	29 (21.2)	98 (71.5)
Q15	An MRI is a good test to identify patients with painful degenerative disc disease because certain findings are consistently predictive of pain. <sup>‡</sup> Correct answer: Strongly disagree	–	–	–	5 (3.6)	20 (14.6)	111 (81)
Q17	I can assess patient function and activity status in my office with careful questioning of the patient. <sup>‡§</sup> Correct answer: Strongly agree	–	–	–	13 (9.5)	44 (32.1)	80 (58.4)
Q18	Chronic myofascial pain syndrome of the gluteal muscles can cause referred pain down the leg with a similar distribution and feeling as sciatica. <sup>‡§</sup> Correct answer: Strongly agree	–	–	–	5 (3.6)	32 (23.4)	97 (70.8)
Q19	I believe that patients who complain of pain out of proportion to its cause are usually drug abusers. Correct answer: Strongly disagree	3 (2.7)	18 (16.4)	88 (80)	0 (0)	17 (12.4)	120 (87.6)
Q21	In chronic pain, the assessment should include measurement of the pain intensity, emotional distress, and functional status. <sup>§</sup> Correct answer: Strongly agree	0 (0)	2 (1.8)	107 (97.3)	1 (0.7)	4 (2.9)	132 (96.4)
Q28	Patients may sleep in spite of severe pain. <sup>§</sup> Correct answer: Strongly agree	57 (51.8)	40 (36.4)	12 (10.9)	77 (56.2)	40 (29.2)	20 (14.6)
Q35	If the patient can be distracted from her/his pain, this usually means that she/he does not have high pain intensity. Correct answer: Strongly disagree	17 (15.5)	57 (51.8)	36 (32.7)	14 (10.2)	65 (47.4)	56 (40.9)
Q38	When back pain radiates down one or both legs, EMG and nerve conduction studies are usually useful for making a diagnosis. <sup>‡</sup> Correct answer: Strongly disagree	–	–	–	60 (43.8)	47 (34.3)	28 (20.4)
Q45	Changes in vital signs (BP, P, R, T) are reliable indicators of pain of severity. Correct answer: Strongly disagree	15 (13.6)	54 (49.1)	40 (36.4)	9 (6.6)	50 (36.5)	77 (56.2)
<b>Defining goals and expectations</b>							
Q4	Which of the following therapies for fibromyalgia syndrome has been shown to yield the most consistent improvement? <sup>†</sup> Correct answer: Aerobic exercises	76 (69.1)	–	34 (30.9)	20 (14.6)	–	116 (84.7)
Q8	There is good medical evidence that interdisciplinary treatment of back pain is effective in reducing disability, pain levels, and returning patients to work. <sup>§</sup> Correct answer: Strongly agree	7 (6.4)	24 (21.8)	79 (71.8)	4 (2.9)	7 (5.1)	126 (92)
Q9	Physical exercise will typically worsen pain and function in patients with arthritis. Correct answer: Strongly disagree	2 (1.8)	13 (11.8)	95 (86.4)	3 (2.2)	15 (10.9)	119 (86.9)
Q16	The spinal cord and higher CNS are often involved in generating the symptoms and signs of neuropathic pain, including sensitivity to touch. <sup>§</sup> Correct answer: Strongly agree	13 (11.8)	23 (20.9)	72 (65.5)	18 (13.1)	24 (17.5)	92 (67.2)
Q23	I have a good understanding of the general indications for surgery for acute herniated disc. <sup>‡§</sup> Correct answer: Strongly agree	–	–	–	2 (1.5)	33 (24.1)	101 (73.7)
Q26	There is good evidence that psychosocial factors predict outcomes from back surgery than the patient's physical characteristics. <sup>§</sup> Correct answer: Strongly agree	29 (26.4)	61 (55.5)	18 (16.4)	8 (5.8)	67 (48.9)	60 (43.8)
Q27	Nerve injuries are particularly likely to producing chronic neuropathic pain states. <sup>§</sup> Correct answer: Strongly agree	4 (3.6)	13 (11.8)	92 (83.6)	1 (0.7)	26 (19)	109 (79.6)
Q32	Chronic, daily pain that has persisted in an unchanging way for years is unlikely to have a clear cause or cure. <sup>§</sup> Correct answer: Strongly agree	66 (60)	23 (20.9)	21 (19.1)	22 (16.1)	37 (27)	77 (56.2)
Q33	Early return to activities is one of my primary goals when treating a patient with recent onset back pain. <sup>§</sup> Correct answer: Strongly agree	11 (10)	37 (33.6)	61 (55.5)	1 (0.7)	19 (13.9)	116 (84.7)
Q36	In the majority of cases, we have the technology to determine the precise pathologic cause of chronic pain. Correct answer: Strongly disagree	8 (7.3)	41 (37.3)	61 (55.5)	8 (5.8)	32 (23.4)	96 (70.1)
<b>Development of a treatment plan</b>							
Q2	Which of the (one) following statements is true regarding selective COX-2 inhibitors? <sup>†</sup> Correct answer: They are no more effective as an analgesic than nonselective NSAIDs.	39 (35.5)	–	71 (64.5)	26 (19)	–	109 (79.6)
Q3	Anticonvulsants and analgesic antidepressants obtain about a 50% response rate (pain intensity reduction in half of patients treated) in treating neuropathic pain. Which of the following drug classes obtains similar results? <sup>†</sup> Correct answer: Opioids	64 (58.2)	–	43 (39.1)	65 (47.4)	–	68 (49.6)
Q12	Antidepressants usually do not improve symptoms and function in chronic pain patients. Correct answer: Strongly disagree	4 (3.6)	15 (13.6)	90 (81.8)	1 (0.7)	15 (10.9)	121 (88.3)
Q22	Elderly patients cannot tolerate medications such as opioids for pain. Correct answer: Strongly disagree	5 (4.5)	21 (19.1)	82 (74.5)	5 (3.6)	14 (10.2)	118 (86.1)
Q24	SSRIs are effective treatment for neuropathic pain. Correct answer: Strongly disagree	44 (40)	42 (38.2)	22 (20)	50 (36.5)	58 (42.3)	29 (21.2)

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**TABLE 4 – CONTINUED**  
**Knowledge, attitudes and beliefs of primary care physicians and pharmacists as evaluated by individual KnowPain-50 questionnaire items**

Initial pain assessment	Item score*					
	Pharmacists (n=110)			Physicians (n=137)		
	0 to 1	2 to 3	4 to 5	0 to 1	2 to 3	4 to 5
Q25 I believe that chronic opioid analgesic therapy in a patient over age 40 without a past history of addiction is associated with a high risk of opioid addiction. Correct answer: Strongly disagree	15 (13.6)	34 (30.9)	59 (53.6)	9 (6.6)	29 (21.2)	99 (72.3)
Q30 I feel comfortable taking a pain history and writing orders for pain medications. <sup>§</sup> Correct answer: Strongly agree	26 (23.6)	56 (50.9)	27 (24.5)	3 (2.2)	29 (21.2)	104 (75.9)
Q37 Long-term use of NSAIDs in the management of chronic pain has higher risk for tissue damage, morbidity and mortality than long-term use of opioids. <sup>§</sup> Correct answer: Strongly agree	19 (17.3)	48 (43.6)	43 (39.1)	10 (7.3)	46 (33.6)	80 (58.4)
Q39 I believe that chronic pain for unknown cause should not be treated with opioids, even if this is the only way to obtain pain relief. Correct answer: Strongly disagree	13 (11.8)	28 (25.5)	69 (62.7)	8 (5.8)	41 (29.9)	87 (63.5)
Q40 Anticonvulsivants have established analgesic efficacy for musculoskeletal, nociceptive or idiopathic pain. Correct answer: Strongly disagree	41 (37.3)	43 (39.1)	25 (22.7)	53 (38.7)	44 (32.1)	39 (28.5)
Q41 The presence of a physiologic basis for pain should be the primary factor when deciding to prescribe opiates. Correct answer: Strongly disagree	29 (26.4)	54 (49.1)	24 (21.8)	37 (27)	55 (40.1)	44 (32.1)
Q42 The management of chronic pain with analgesics and adjuvant drugs only is effective in most patients. Correct answer: Strongly disagree	43 (39.1)	52 (47.3)	15 (13.6)	37 (27)	63 (46)	37 (27)
Q43 I understand how to diagnose and treat different types of pain. <sup>†§</sup> Correct answer: Strongly agree	–	–	–	2 (1.5)	51 (37.2)	84 (61.3)
Q44 I feel comfortable calculating conversion doses of commonly used opioids. <sup>§</sup> Correct answer: Strongly agree	6 (5.5)	39 (35.5)	65 (59.1)	5 (3.6)	34 (24.8)	98 (71.5)
Q46 Cognitive behavioural therapy is very effective in chronic pain management and should be applied as early as possible in the treatment plan for most chronic pain patients. <sup>§</sup> Correct answer: Strongly agree	3 (2.7)	29 (26.4)	78 (70.9)	4 (2.9)	38 (27.7)	94 (68.6)
Q48 Persons who fit the profile of a likely drug abuser should never be treated with opioids. Correct answer: Strongly disagree	15 (13.6)	56 (50.9)	39 (35.5)	13 (9.5)	64 (46.7)	60 (43.8)
<b>Implementation of a treatment plan</b>						
Q5 The most common adverse side effect of opioid therapy is:... <sup>†</sup> Correct answer: Constipation	22 (20)	–	87 (79.1)	4 (2.9)	–	132 (96.4)
Q34 Morphine-induced sedation is only a transient problem and will usually clear with continued use. <sup>§</sup> Correct answer: Strongly agree	8 (7.3)	28 (25.5)	74 (67.3)	14 (10.2)	44 (32.1)	78 (56.9)
Q47 There is a limit or 'ceiling' to the dosage of pure agonist opioids (eg, morphine) that can be used to control a patient's pain. Correct answer: Strongly disagree	22 (20)	16 (14.5)	72 (65.5)	15 (10.9)	30 (21.9)	92 (67.2)
<b>Reassessment and management of longitudinal care</b>						
Q49 I believe that analgesic tolerance to opioids usually limits long-term use. Correct answer: Strongly disagree	27 (24.5)	44 (40)	39 (35.5)	18 (13.1)	49 (35.8)	69 (50.4)
<b>Management of environmental issues</b>						
Q6 If my opioid prescribing was investigated tomorrow, I am confident that I would pass. <sup>§</sup> Correct answer: Strongly agree	7 (6.4)	38 (34.5)	64 (58.2)	3 (2.2)	29 (21.2)	105 (76.6)
Q10 Under federal regulations, it is not lawful to prescribe an opioid to treat pain in a patient with a diagnosed substance use disorder. Correct answer: Strongly disagree	12 (10.9)	23 (20.9)	75 (68.2)	10 (7.3)	24 (17.5)	103 (75.2)
Q14 It is illegal for a physician to prescribe methadone for pain, unless he/she is certified in addiction medicine. Correct answer: Strongly disagree	58 (52.7)	9 (8.2)	42 (38.2)	94 (68.6)	8 (5.8)	34 (24.8)
Q20 Under federal regulations, it is permitted to issue prescriptions that are postdated. Correct answer: Strongly disagree	44 (40)	13 (11.8)	52 (47.3)	13 (9.5)	24 (17.5)	100 (73)
Q29 I know how to obtain information about both state and federal requirements for prescribing opioids. <sup>§</sup> Correct answer: Strongly agree	7 (6.4)	24 (21.8)	79 (71.8)	31 (22.6)	46 (33.6)	59 (43.1)
Q31 I am confident that I understand state and federal requirements for prescribing opioids analgesics for chronic pain. <sup>§</sup> Correct answer: Strongly agree	4 (3.6)	29 (26.4)	77 (70)	8 (5.8)	38 (27.7)	90 (65.7)
Q50 Under federal regulations, there are limits on the number of dosages of opioids that can be prescribed at one time. Correct answer: Strongly disagree	21 (19.1)	29 (26.4)	60 (54.5)	24 (17.5)	41 (29.9)	72 (52.6)
<b>Pharmacotherapy</b>						
P1 Amongst the following choices, which best represents the classes of first line medication recommended for the treatment of patients suffering from chronic neuropathic pain? <sup>†</sup> Correct answer: The anticonvulsivants and the antidepressants.	51 (46.4)	–	57 (51.8)	34 (24.8)	–	103 (75.2)
P2 What is the recommended therapy for the treatment of constipation in patients receiving chronic opioid therapy? <sup>†</sup> Correct answer: The combination of a stool softener and a stimulant laxative is ideal.	8 (7.3)	–	102 (92.7)	35 (25.5)	–	102 (74.5)
P3 Which of the following affirmations is true? <sup>†</sup> Correct answer: Among patients on nonselective NSAIDs, only those at risk of gastric toxicity should receive gastroprotective agent.	59 (53.6)	–	51 (46.4)	72 (52.6)	–	64 (46.7)
P4 Amongst the following choices, in which cases would you prefer acetaminophen to an NSAID to control pain? <sup>†</sup> Correct answer: Suffer from or have risk factor for chronic kidney disease and/or gastric pathology.	24 (21.8)	–	86 (78.2)	46 (33.6)	–	90 (65.7)

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**TABLE 4 – CONTINUED**  
**Knowledge, attitudes and beliefs of primary care physicians and pharmacists as evaluated by individual KnowPain-50 questionnaire items**

		Item score*					
		Pharmacists (n=110)			Physicians (n=137)		
		0 to 1	2 to 3	4 to 5	0 to 1	2 to 3	4 to 5
<b>Initial pain assessment</b>							
P5	Which of the following doses of hydromorphone per os is considered equivalent to 10 mg of morphine? <sup>†</sup> Correct answer: 2 mg	24 (21.8)	–	84 (76.4)	32 (23.4)	–	104 (75.9)
P6	Concerning fibromyalgia, which of the following affirmations is true? <sup>†</sup> Correct answer: Clinical studies have demonstrated the effectiveness and safety of pregabalin.	32 (29.1)	–	74 (67.3)	29 (21.2)	–	105 (76.6)
P7	Concerning the following tricyclic antidepressants, which should be avoided when treating senior patients, given the adverse side effects of anticholinergics and sedatives? <sup>†</sup> Correct answer: Amitriptyline	17 (15.5)	–	90 (81.8)	29 (21.2)	–	102 (74.5)

BP Blood pressure; CNS Central nervous system; COX-2 Cyclooxygenase-2; EMG Electromyography; MRI Magnetic resonance imaging; NSAID Nonsteroidal anti-inflammatory drug; P Pulse; R Respiration; SSRI Selective serotonin reuptake inhibitor; T Temperature. \*Vary from 0 to 5 where a score of 0 is attributed to the worst answer and a score of 5 is attributed to the best possible answer; <sup>†</sup>Question with dichotomous answer, 5 points for a correct answer and 0 point for an incorrect answer; <sup>‡</sup>Question answered by physicians only; <sup>§</sup>Results reported on an inverted response scale

**TABLE 5**  
**Needs and preferences of physicians and pharmacists regarding the format and content of a continuing education program (CEP) for chronic noncancer pain (CNCP) and its treatment**

	Pharmacists (n=109)	Physicians (n=136)
<b>From your standpoint, is there a need for a CEP in CNCP for primary care physicians (or pharmacists)?</b>		
Yes	109 (100)	136 (100)
<b>What would be the best educational vehicle(s) or method(s) for a CEP?</b>		
Interactive activities or courses (PBL)	52 (47.7)	89 (65.4)
Self-learning modules (paper format)	51 (46.8)	48 (35.5)
Scientific presentations by peers	45 (41.3)	55 (40.4)
Self-learning modules (Internet based)	37 (33.9)	58 (42.6)
Formal lectures	34 (31.2)	49 (36.0)
Training days in a pain management clinic	31 (28.4)	37 (27.2)
Other	0 (0.0)	10 (7.4)
<b>In which area(s) would you like to have more training with regard to CNCP?</b>		
Review of Canadian and/or Quebec guideline recommendations	84 (77.1)	64 (47.1)
Indication and use of:		
Anticonvulsants	70 (64.2)	41 (30.1)
Antidepressants	67 (61.5)	38 (27.9)
Opioids	66 (60.6)	42 (30.9)
NSAIDs and coxibs	53 (48.6)	25 (18.4)
<b>Pharmacists' specific topics</b>		
Detection and management of drug-related problems	61 (56.0)	–
Pharmaceutical care with analgesic dose adjustment	59 (54.1)	–
Nonpharmacological methods to manage chronic pain	58 (53.2)	–
Detection and management of side effects	43 (39.4)	–
Physician-pharmacist workshop on collaborative practices	41 (37.6)	–
Diagnosis update	30 (27.5)	–
<b>Physicians' specific topics</b>		
Differential diagnoses of chronic pain syndromes	–	97 (71.3)
Trigger-point-injection intervention techniques; joint or muscle infiltration	–	61 (44.9)
Psychological techniques for chronic pain	–	55 (40.4)
Indication and referral procedure for patient to a multidisciplinary pain management clinic	–	55 (40.4)
Physical assessment of patient	–	50 (36.8)
Psychological assessment of patient	–	44 (32.4)
Psychological follow-up of patient	–	41 (30.1)
Physical follow-up of patient	–	36 (26.5)
Physical treatment techniques for chronic pain	–	35 (25.7)
Radiological assessment of patient	–	24 (17.6)
Other	–	9 (6.6)

Data presented as n (%). Coxib Selective cyclooxygenase-2 inhibitor; NSAID Nonsteroidal anti-inflammatory drug; PBL Problem-based learning

studies suggest that primary care physicians and pharmacists are not aware of – or do not follow – guideline recommendations (13,14,42,43). In our survey, 77.1% of pharmacists and 47.1% of physicians identified the review of guideline recommendations as an area of interest for

additional training. The performance of clinicians on the different KnowPain-50 questions shows that they also need to learn better how to apply these recommendations in specific clinical situations. Such deficient pain KAB has also been reported by others (11,15).



Surprisingly, we found no significant correlation between the perceived needs of clinicians regarding CEPs and their level of pain KAB. This result highlights the importance of basing the development of CEPs on objective questionnaires such as the KnowPain-50.

In our survey, more CEP training was positively associated with higher levels of pain KAB. However, the correlation was low; 10 h of training in the past five years were associated with an increase of 0.3 points in the overall KnowPain-50 score. It is important to note that previous attendance at CEP sessions was based on self-reported cross-sectional data and may have been overestimated by social desirability (tendency to give socially desirable answers) and memory biases. Furthermore, the recall period was very long (five years). These factors may explain why our results are not in line with those reported by others. For example, Harris et al (26) found that the KnowPain-50 questionnaire could detect an improvement in KAB three months after attending a speaker's presentation and a publicly available online continuing medical education program. Other investigators have also shown that CEPs are able to improve knowledge (44-46), clinical practices and patient outcomes (47).

In our survey, 65.4% of physicians and 47.7% of pharmacists selected interactive training as one of their preferred educational vehicles. This is an interesting finding, considering that a CEP based on a mix of interactive and didactic methods has been shown to be among the most effective approaches for improving professional practice (47). Also noteworthy is the fact that despite the rapid growth in online CEPs (48), only 42.6% of physicians and 33.9% of pharmacists indicated an interest in Internet-based self-learning modules. Internet-based technologies are evolving rapidly and may now include multifaceted interventions such as interactive cases, enabling tools, and didactic presentations. Asynchronous discussions with peers and a facilitator may also be added to allow participants to discuss the content of the program and ask questions (49,50). This appears to improve physician satisfaction (51). Primary care clinicians may not be fully aware of the potential benefits of Internet-based training. We have no information about the participants' previous exposure to different formats of CEPs.

In primary care, pharmacists can play an important role in the management of CNCP (10). In several studies, pharmacist interventions were associated with positive patient outcomes (52-55). However, lack of time and remuneration (56,57) may limit their involvement. Some may see treating patients with chronic pain as extremely time consuming (14,43). This concern has been documented among primary care physicians as well (13). In our study, it is encouraging to note that more than one-half of the pharmacists were interested in a CEP on the provision of advanced pharmaceutical care, such as detection and management of drug-related problems, pharmaceutical care with analgesic dose adjustment and non-pharmacological methods of pain management. However, only 37.6% reported an interest in participating in a physician-pharmacist workshop on collaborative practices; our data provide no explanation for this low response. Given the pharmacists' level of knowledge about pain and its treatment, they may not feel prepared to initiate active collaborative practices. Similar information from physicians is not available.

#### Strengths and limitations

The present study provides a unique overview of the KAB of primary care physicians and pharmacists currently involved in managing CNCP patients. A modified version of the KnowPain-50 questionnaire was carefully developed for pharmacists by a panel of experts and demonstrated similar reliability. The implementation of a multistep approach to sending out the survey resulted in a relatively high participation rate (5). Participating clinicians may not be representative of the entire community of primary care physicians and pharmacists. However, our sample probably consisted of clinicians actually managing chronic pain patients on a day-to-day basis and may, therefore, represent a 'best case' scenario.

Despite the rigorous approach taken by the developers of the KnowPain-50 questionnaire, it nonetheless includes 'double-barrelled' questions (ask two or more questions at the same time, each of which can

be answered differently) that may be difficult to answer (eg, question 32, regarding the cause and cure of pain, and question 30, regarding taking pain history and writing orders). This may reduce the interpretability of the results as well as the reliability of the questionnaire. The questionnaire may also be perceived as unbalanced, given that, except for question 5, all the questions on opioids tend to cast them in a positive light (eg, questions 22, 25, 34, 37, 39 and 48). Furthermore, the finding regarding the impact of additional CEP training on chronic pain KAB may be inaccurate because precise self-reporting of the number of hours of such activities in the past five years is rather difficult. Unfortunately, we did not ask pharmacists or physicians for consent to link the results of this survey to the information on their patients in the cohort. Consequently, it was not possible to investigate whether more appropriate KAB was associated with better management of CNCP and greater patient satisfaction.

#### CONCLUSION

The present study clearly indicates that, although most pharmacists and physicians had participated in CEPs about chronic pain management, their KAB remain far from optimal. CEP sessions need to target their knowledge and clinical competencies as well as their inappropriate beliefs and attitudes about pain and its treatment.

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