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Impact of a systematic education model for palliative care in cancer

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Received February 26, 2019, accepted March 26, 2019

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Pharmazie 74: 499-504 (2019)

doi: 10.1691/ph.2019.9417

In clinical practice, pharmacists are continually required to improve their knowledge and expertise; however, the postgraduate education system for professional development cannot be confidently stated to be well established. The establishment of a systematic and multifaceted educational curriculum should be useful to improve home care and pharmacists' contribution; therefore, we developed a curriculum in collaboration with the university faculty of pharmaceutical sciences, department of pharmacy in hospital, and the Fukuoka Pharmaceutical Association. Class topics were extracted from the "Kanwa-Iryou-Yakugaku", edited by the Japanese Society for Pharmaceutical Palliative Care and Sciences. The items are necessary to perform palliative care as a pharmacist. A class schedule of 6 days (24 classes in total) was formulated. Questionnaires on comprehension degree before and after each class were provided to the participants. Comprehension was assessed on a scale of 1 to 10, where "I do not understand at all" was 1 and "I understand enough" was 10. The average recovery rates of questionnaires from each class were 92.6 % and 88.9 % before and after class, respectively. The average number of participants who completely answered the questionnaire before and after class was 45.6; therefore, these data were analyzed. Comprehension degree on each topic had significantly increased after attendance of all classes ($p < 0.01$). The comprehension degree of participants of the medical science of palliative care did greatly improve. Consequently, it is clear that the standard education model constructed was meaningful for the professional development of pharmacists in palliative care medicine.

1. Introduction

The Japanese Ministry of Health, Labor, and Welfare is promoting the creation of "community-based integrated care systems" (http://www.mhlw.go.jp/stf/seisakunitsuite/bunya/hukushi_kaigo/kaigo_koureisha/chiiki-houkatsu/) by 2025 to meet the expected increase in the need for medical and nursing care (Tsutsui 2014). In 2013, 25 % of people in Japan were 65 years of age or older, and because this number is expected to increase to above 30 % in 2025 and 40 % in 2060, medical needs are expected to change from "hospital-centered medicine" to "home healthcare" (Arai et al. 2015). Therefore, to enable individuals to live their life as desired in their own homes, it is necessary to provide multidisciplinary care that integrates community-based medical care, nursing care, and living support (Morikawa 2014). Naturally, improvements in medical expertise in home healthcare are also desired.

The government decided on a vision of pharmacies for patients and decided to reorganize insurance pharmacies as primary pharmacies to manage medication information of patients in an integrated way by 2025 (http://www.mhlw.go.jp/file/04-Houdou-happyou-11121000-Iyakushokuhinkyoku-Soumuka/gaiyou_1.pdf). The government also decided to train primary pharmacists

to conduct pharmaceutical management based on information, patient education, 24-h correspondence, and home care. Moreover, it is intended that pharmacists should be able to show high-quality knowledge, technique, and experience by acquiring academic qualifications. However, it is difficult for health insurance pharmacists to attain the required standard in the conventional postgraduate system, especially in home care and multidisciplinary care (Utsumi et al. 2015). Therefore, a new systematic and multifaceted education model is required for pharmacists to play an active role in home medical care teams.

This problem is also relevant for the postgraduate education system of medical doctors. In Japan, the care of distress and pain of patients with cancer has been inadequate because basic palliative care has not been included in the pre- and postgraduate medical education systems. To overcome these problems, the government detailed measures in "The Basic Plans to Promote Anti-Cancer Measures" (http://www.mhlw.go.jp/file/06-Seisakujouhou-10900000-Kenkoukyoku/gan_keikaku03.pdf) enacted in 2007. In the plan, it is a priority that all medical doctors engaged in cancer care should acquire basic knowledge and skills in palliative care. Therefore, education about palliative care for medical doctors has advanced rapidly. A workshop has been offered as a basic learning program in palliative care, which has been delivered on a global scale to a large number of graduates. This program is based on the "Palliative Care Emphasis Program on Symptom Management and Assessment for Continuous Medical Education" (PEACE) project (<http://www.jspm-peace.jp/about/>), which is a basic palliative care educational project cooperatively created by the Japanese Society for Palliative Medicine (JSPM) and the Japan Psycho-Oncology Society (JPOS) in 2008, and has since been improved in areas such as insufficient

Abbreviations: BCPPP: Board Certified Pharmacist in Palliative Pharmacy; JPOS: Japan Psycho-Oncology Society; JPPS: Japanese Society for Pharmaceutical Palliative Care and Sciences; JSPM: Japanese Society for Palliative Medicine; MSW: Medical social worker; PEACE: Palliative Care Emphasis program on Symptom Management and Assessment for Continuous Medical Education

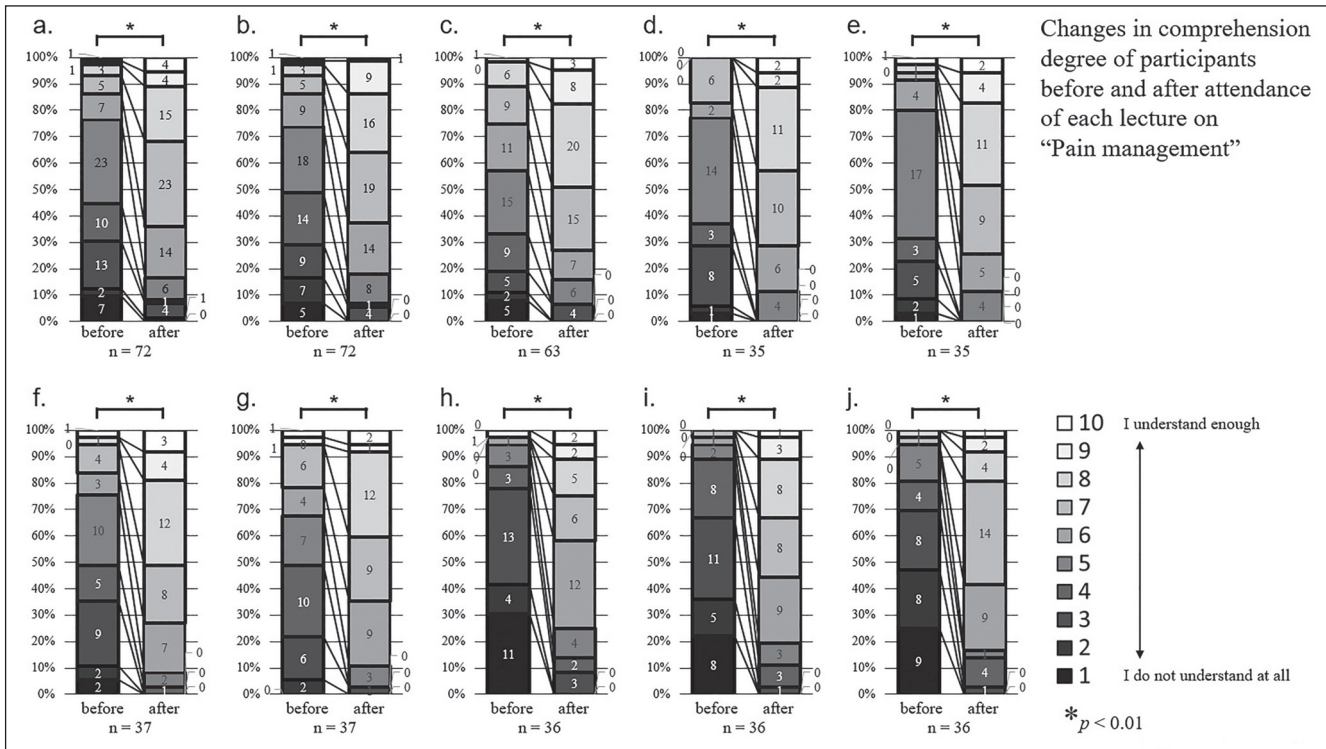


Fig. 1: Changes in comprehension degree of participants before and after attendance of each class on "Pain management". a. "General palliative care" (n = 72), b. "General pain management" (n = 72), c. "Characteristics of non-opioid analgesics" (n = 63), d. "Characteristics of opioid analgesics" (n = 35), e. "Adverse effects of opioid analgesics" (n = 35), f. "Dependence and tolerance of opioid analgesics" (n = 37), g. "Analgesic adjuvant" (n = 37), h. "Radiotherapy" (n = 36), i. "Nerve block" (n = 36), j. "Physiotherapy approach" (n = 36). In all classes, comprehension degree was significantly higher after class than before class ($p < 0.01$, Wilcoxon signed-rank test). In particular, comprehension degree of participants on h. "Radiotherapy", i. "Nerve block", and j. "Physiotherapy approach" tended to be greater after class than before class.

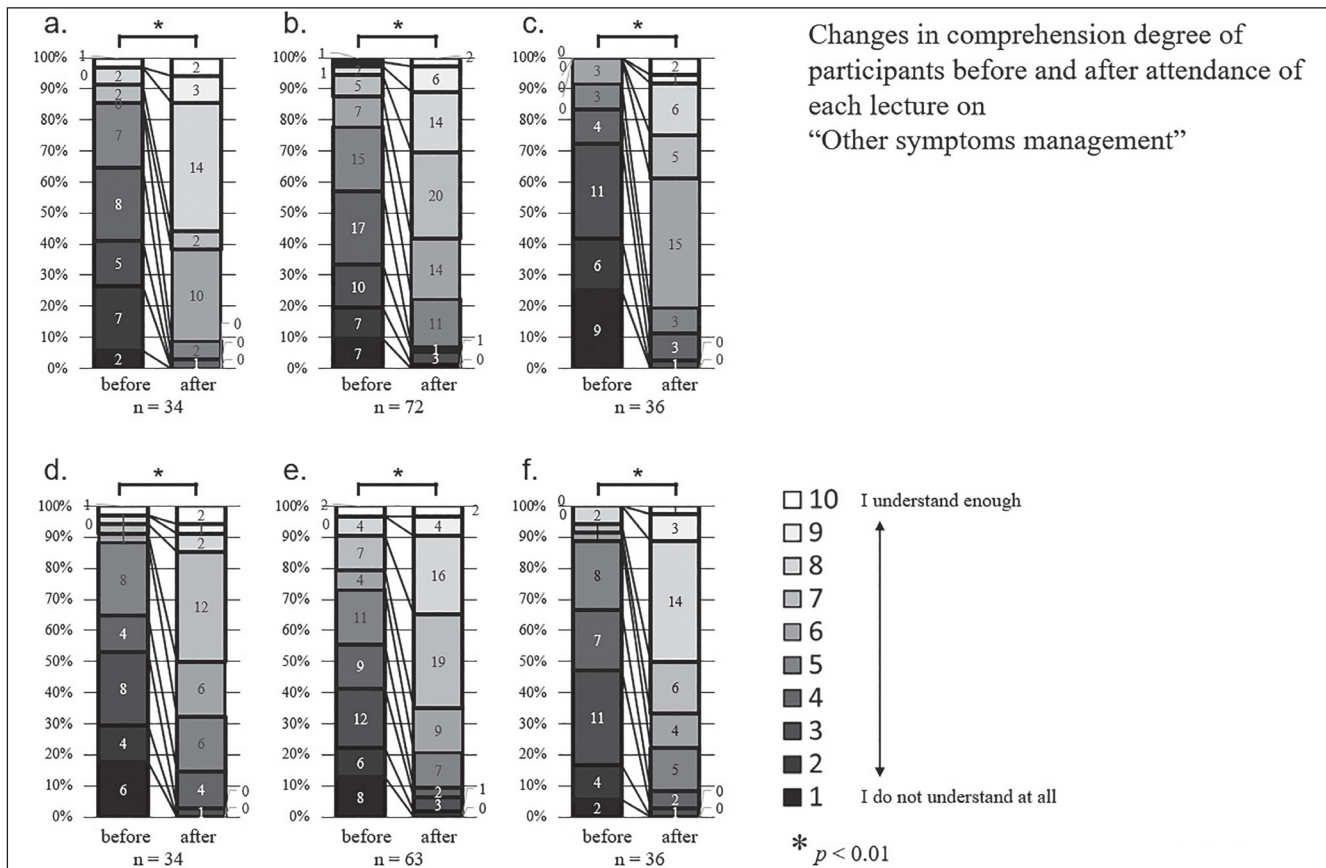


Fig. 2: Changes in comprehension degree of participants before and after attendance of each class on "Other symptoms management". a. "Respiratory symptoms of the terminal stage" (n = 34), b. "Gastrointestinal symptoms of the terminal stage" (n = 72), c. "Urological symptoms of the terminal stage" (n = 36), d. "Fluid therapy for the terminal stage" (n = 34), e. "Psychiatric symptom management" (n = 63), f. "Sedation to relieve pain" (n = 36). In all classes, comprehension degree was significantly higher after class than before class ($p < 0.01$, Wilcoxon signed-rank test).

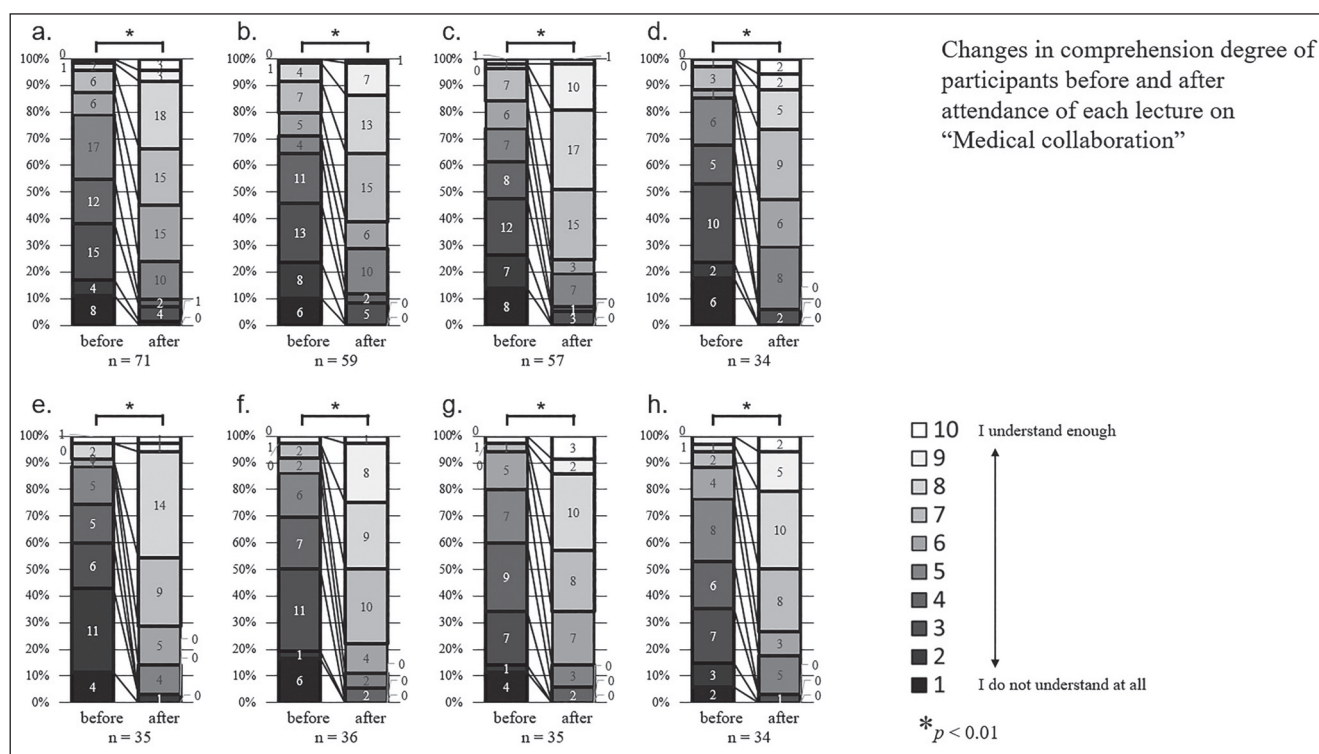


Fig. 3: Changes in comprehension degree of participants before and after attendance of each class on "Medical collaboration". a. "Role of physician in charge of physical symptoms" (n = 71), b. "Role of physician in charge of mental symptoms" (n = 59), c. "Role of nursing for palliative care" (n = 57), d. "Role of nutritionist" (n = 34), e. "Role of MSW" (n = 35), f. "Role of home doctor" (n = 36), g. "Role of home pharmacist" (n = 35), h. "Role of palliative care team" (n = 34). In all classes, comprehension degree was significantly higher after class than before class ($p < 0.01$, Wilcoxon signed-rank test).

opioid prescription (Yamaguchi et al 2012). More than 90 % of doctors engaged in cancer care were required to attend palliative care workshops for medical doctors in cancer therapy-based hospitals by the end of June 2017; it appears that the majority of doctors engaged in cancer therapy-based hospitals have already completed the course because 101,019 doctors had attended the course by July 2017 (<http://www.mhlw.go.jp/file/05-Shingikai-10901000-Kenkoukyoku-Soumuka/0000176372.pdf>). The educational system of palliative care and psycho-oncology for doctors has dramatically advanced owing to improvements in the program over the last ten years and the widening of the education system in academic organizations and hospitals.

In contrast, attendance of palliative care workshops for pharmacists was not specified in The Basic Plans to Promote Anti-Cancer Measures. Currently, pharmacists can only engage in palliative care education through self-organized attendance of palliative care workshops held by pharmaceutical societies, academic societies, and public organizations. However, most palliative care workshops for pharmacists are held in metropolitan areas; with responsibility for their own expenses, the burden on pharmacists is considerable. Therefore, pharmacists in provincial districts have difficulty in attending such workshops.

In comparison with those in the US and Europe, Japan's attempts in palliative care of cancer are behind schedule. Therefore, in this study, we focused on long-term home care of patients with cancer. Establishment of a systematic and multifaceted educational curriculum may be useful in improving home care and pharmacists' contributions; therefore, we developed a curriculum in collaboration with a university faculty of pharmaceutical sciences, department of pharmacy in hospital, and the Fukuoka Pharmaceutical Association. This trial is a pilot study, and exactly the first study involving a cooperative approach of various fields in Japan. The first objective was to improve comprehension on palliative care in pharmacists who attended the abovementioned classes. The second objective was to confirm that the standard education model constructed for pharmacists in palliative medicine is meaningful. We believe that dissemination of this model throughout Japan will greatly contribute

in provisioning high-quality, community-based, integrated care systems, as required by the Japanese Ministry of Health, Labor, and Welfare. Therefore, we assessed the usefulness of our curriculum and the effects of palliative care workshops in pharmacists.

2. Investigations and results

2.1. Changes in comprehension degree between before and after each class

Recovery rate and number of participants were different in each class. For data analysis, we selected participants whose names match before and after class. The average recovery rate of questionnaires overall classes was 92.6 % (85.4–100 %) before the class and 88.9 % (77.1–100 %) after the class. The average number of participants who answered the questionnaire before and after each class was 45.6. Comprehension degree on each division significantly increased after attendance of all classes ($p < 0.01$) (Figs. 1-3).

In particular, comprehension degree on "radiotherapy", "nerve block", and "physiotherapy approach" tended to be greater after class than before class (Fig. 1).

2.2. Class attendance-induced changes in anxiety over examination to become a qualified pharmacist for palliative drug therapy

The recovery rate of the survey form was 95.9 % before whole-curriculum (71 out of 74 participants) and 93.3 % after whole-curriculum (42 out of 45 participants). Among them, 27 respondents were matched and their data were analyzed. The age, years of experience, and workplace distribution of the participants are shown in Table 1. There was no person who was already qualified as a palliative drug therapy-approved pharmacist.

Pharmacists did not feel uneasy about the qualifications required to become "a certified pharmacist by the Japan Pharmacists Education

Table 1: Background of matched respondents

		n	(%)
Age, years	20s	4	(14.8)
	30s	4	(14.8)
	40s	8	(29.6)
	50s	10	(37.0)
	more than 60	1	(3.7)
Pharmacy experience, years	1 to 3	0	(0)
	3 to 5	3	(11.1)
	6 to 10	2	(7.4)
	11 to 20	9	(33.3)
	more than 21	13	(48.1)
Workplace distribution	Hospital or clinic	7	(26.0)
	Insurance pharmacy	20	(74.0)

Center”, “certified pharmacist in the Japanese Society of Hospital Pharmacists Lifelong Training Course”, or “certified pharmacist in the Japanese Society of Pharmaceutical Health Care and Sciences” before and after attendance. “A pharmacist should be engaged in palliative care in a team or ward of a facility, such as a hospital or clinic, or should be engaged in an insurance pharmacy in cooperation with a medical facility, such as a homecare support clinic that has a narcotic drug retailing license, for more than 3 years.” The number of attendants who were anxious about this request was 16 (59.3 %) before the classes and 11 (40.7 %) after the classes.

A pharmacist must take a minimum of the specified units (20 credits in each year from a total of 100 credits) for certified classes. Moreover, within the previous 5 years, a pharmacist should have attended at least one class on cancer pain reduction and the proper use of medical narcotics promoted by the Ministry of Health, Labor and Welfare, or the Narcotics and Stimulant Medicine Abuse Prevention Center. The number of attendants who were anxious about their participation was 13 (48.1 %) before the classes and 8 (29.6 %) after the classes; hence, a significant reduction in the proportion was observed.

A pharmacist should conduct presentations at the annual meeting of the society of this academic society or separately held academic conference for more than twice (at least once as a first speaker) in the period when they are engaged in practice as a pharmacist. The number of attendants who were anxious about this request was 21 (77.8 %) before and after attendance.

A pharmacist in a hospital, or another place of practice, should present more than 30 cases according to the form prescribed by the society regarding achievement of medical management guidance in palliative care area. A pharmacist in an insurance pharmacy should present more than 15 cases according to the form prescribed by the society regarding achievement of medical management guidance in palliative care area. The number of attendants who were anxious about this request was 21 (77.8 %) before the classes and 23 (85.2 %) after the classes.

3. Discussion

Currently, components of the systematic palliative care education, “Education in Palliative and End-of-Life Care Oncology,” which is a basic educational program of palliative care and terminal care provided by the American Society of Clinical Oncology Care-Oncology (<http://www.epec.net/EPEC/webpages/Index.Cfm>), as well as the PEACE project (<http://www.jspm-peace.jp/about/>) of the

Table 2: Twenty-four classes of palliative care workshops for pharmacists

Divisions	Classes (90 min per class)
Pain management	a. General palliative care
	b. General pain management
	c. Characteristics of non-opioid analgesics
	d. Characteristics of opioid analgesics
	e. Adverse effects of opioid analgesics
	f. Dependence and tolerance of opioid analgesics
	g. Analgesic adjuvant
	h. Radiotherapy
	i. Nerve block
	j. Physiotherapy approach
Other symptoms management	a. Respiratory symptoms of the terminal stage
	b. Gastrointestinal symptoms of the terminal stage
	c. Urological symptoms of the terminal stage
	d. Fluid therapy for the terminal stage
	e. Psychiatric symptom management
	f. Sedation to relieve pain
Medical collaboration	a. Role of physician in charge of physical symptoms
	b. Role of physician in charge of mental symptoms
	c. Role of nursing for palliative care
	d. Role of nutritionist
	e. Role of medical social worker
	f. Role of home doctor
	g. Role of home pharmacist
	h. Role of palliative care team

JSPM and JPOS are known. However, these educational programs are targeted mainly to physicians, and no educational programs on basic palliative care are reported to be available for pharmacists. This study is the very first report of systematic palliative care education programs for insurance pharmacy and hospital pharmacists in Japan.

Palliative care means the prevention and reduction of pain by early accurate assessment, resolution, and reduction of pain and physical, psychosocial, and spiritual problems for patients and their families, who are facing problems associated with life-threatening diseases (WHO 2002). This approach is very different from the conventional approach of terminal care. Contemporary palliative care does not include only physical care but also positive and total

Table 3: Investigation of comprehension degree in each class

Comprehension degree in each class	
Before class : 1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9 , 10	
← I do not understand at all	I understand enough →
After attendance: 1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9 , 10	
← I do not understand at all	I understand enough →

Table 4: Survey throughout the workshop

Q1. Age (as of before attendance)	20s, 30s, 40s, 50s, over 60s
Q2. Years of experience as a pharmacist (as of before attendance)	less than 3 years, 3–5 years, 6–10 years, 11–20 years, over 21 years
Q3. Workplace	Dispensing pharmacies, Hospitals or clinics, Other
Q4. Anxiety over BCPPP1) examinations before and after attendance.	
1. Either a certified pharmacist of the Japan Pharmacists Education Center, certified pharmacist in the Japanese Society of Hospital Pharmacists Lifelong Training Course, or certified pharmacist of the Japanese Society of Pharmaceutical Health Care and Sciences before and after attendance.	Easy, Not easy
2. A pharmacist should be engaged in palliative care in a team or ward of a facility, such as a hospital or clinic, or should be engaged in an insurance pharmacy in cooperation with a medical facility, such as a home care support clinic that has narcotic drug retailing license, for more than 3 years.	Easy, Not easy
3. A pharmacist must take at least specified units (20 credits in each year from total of 100 credits) for certified classes. Within the past 5 years, a pharmacist should attend classes on cancer pain reduction and proper use of medical narcotics promoted by the Ministry of Health, Labor, and Welfare, or the Narcotics and Stimulant Medicine Abuse Prevention Center, for more than once.	Easy, Not easy
4. A pharmacist should have presentations at the annual meeting of the society of this academic society or separately held academic conference more than twice (at least once as a first speaker) in the period when he is engaged in practice as a pharmacist.	Easy, Not easy
5. A pharmacist in a hospital etc. should present more than 30 cases according to the form prescribed by the society regarding achievement of medical management guidance in palliative care area. A pharmacist in an insurance pharmacy should present more than 15 cases according to the form prescribed by the society regarding achievement of medical management guidance in palliative care area.	Easy, Not easy

¹⁾ BCPPP: Board Certified Pharmacist in Palliative Pharmacy

human care, which considers psychological distress, social problems, and spiritual suffering to ensure that patients and their families have a quality of life as high as possible. For example, patients may often enter a depressive state or experience the psychological reaction of depression, but it was reported that suitable training is useful to identify this, regardless of the occupation (Rayner et al. 2011). Furthermore, in a report by Temel et al. (2010), it was shown that early palliative care does not only improve patients' quality of life and ameliorate depression but also improve the prognosis of patients with non-small cell lung cancer, thereby suggesting that provision of palliative care from the early stages of cancer may be effective.

Under such circumstances, as part of the program, the learning goal of the "Palliative Care Workshop for Pharmacists" is to "acquire minimal fundamental palliative care knowledge for pharmacists engaged in palliative care" over 6 days in 2 years (4 classes/day). Other factors that we emphasized during the preparation of the basic educational program of "Palliative Care Workshop for Pharmacists" were as follows: 1) accurate assessment and management of pain in patients; 2) effective approaches to relieve symptoms other than pain symptoms (digestion, respiration, mental condition, and urinary system condition); 3) cooperation with doctors, nurses, nutritionists, and MSW as a multi-disciplinary collaboration. To place these three topics in context, we focused on three sessions of "Pain management," "Other symptoms management," and "Medical collaboration" (Table 2).

In this pilot study, by introducing our education curriculum, we obtained significant results in a wide range of fields from basic to clinical sessions of "Pain management," "Other symptoms management," and "Medical collaboration" (Figs. 1-3). The results were consistent with reports by Yamamoto et al. (2013, 2105) that used a palliative care knowledge questionnaire for PEACE (PEACEQ). Their results showed that a doctor's attitude to the patient's symptoms may change between before and after attendance of the palliative care workshop. Moreover, it may increase the possibility of response. Therefore, our results may also indicate the same effect. In addition, to evaluate educational programs, methods using pre- and post-test are reported (von Gunten et al. 2009; Chang et al.

2009). Thus, our curriculum appears reasonable for an evaluation of the comprehension degree of pharmacists. This curriculum was organized by the Fukuoka Pharmaceutical Association; we could take advantage of the local area, and this was found to be useful to enhance the motivation of insurance and hospital pharmacists to participate.

The "Palliative Care Workshop for Pharmacists" improved the comprehension degree of pharmacists on the relief of patient symptoms, which suggested a possibility that the response range might expand. Development of a new systematic and multifaceted educational curriculum might be effective for pharmacists and allow them to play an active part in home medical care. To continue the provision of a standardized basic education program, it is essential to structure the workshops and standardize the contents. Whenever the workshops are held, it is necessary to revise the operation manual and update the contents of the sessions. In the next stage, we would like to evaluate how participants in these workshops intervene in clinical medicine. In addition, pharmacists who have completed the course can act as a trainer that uses the train-the-trainer system to teach insurance pharmacy and hospital pharmacists in each region.

The participants' comprehension on palliative care medical science was greatly improved by attending the classes. Thus, it is clear that the standard education model constructed was meaningful for the development of pharmacists in palliative medicine.

4. Experimental

4.1. Object

We targeted insurance pharmacies and hospital pharmacists engaged in palliative care in the Fukuoka prefecture. Pharmacists who took part in palliative care workshops held between April 2016 and August 2017 were surveyed by using a questionnaire. This study was conducted with approval from the Osaka University of Pharmaceutical Sciences (approval No. 0060 of the institutional review board).

4.2. Workshops

The workshop opening guide was mailed to members of the Fukuoka Pharmaceutical Association. The workshop was organized and operated by the association.

Participating pharmacists were required to become a member of the Japanese Society for Pharmaceutical Palliative Care and Sciences (JPPS) and hopefully became a Board Certified Pharmacist in Palliative Pharmacy (BCPPP), which is necessary to clear various conditions as described below. Pharmacists must take a minimum of the specified units (20 credits in each year from a total of 100 credits) for certified classes. Moreover, within the previous 5 years, pharmacists should have attended at least one class on cancer pain reduction and the proper use of medical narcotics promoted by the Ministry of Health, Labor, and Welfare, or the Narcotics and Stimulant Medicine Abuse Prevention Center. Pharmacists should conduct presentations at the annual meeting of the society of this academic society or a separately held academic conference for more than twice (at least once as a first speaker) in the period when they are engaged in practice as a pharmacist. Pharmacists in a hospital or other place of practice should present more than 30 cases according to the form prescribed by the society regarding achievement of medical management guidance in palliative care area. Pharmacists in an insurance pharmacy should present more than 15 cases according to the form prescribed by the society regarding achievement of medical management guidance in palliative care area. For the classes, this workshop constructed a curriculum that will be useful for pharmacists aiming to become a BCPBP.

4.3. Curriculum

Twenty-four classes were extracted from the Kanwa-Iryou-Yakugaku (Japanese Society for Pharmaceutical Palliative Care and Sciences, 2013 #194), a medical text book on pharmaceutical palliative care published by the JPPS. Knowledge on its contents was considered necessary to perform palliative care as a pharmacist at a clinical site. We categorized these 24 classes into three divisions: "Pain management," "Other symptoms management," and "medical cooperation" (Table 2). The classes were selected from medical faculties or assistant professor-level medical doctors, specialized pharmacists, and other specialized medical staff, who were active not only in academic research but also in practice. Lecturers from the Fukuoka prefecture were selected because participants could continue to interact with them if required. The class schedule was formulated from the following three topics:

1. "Pain management"

The following ten classes are related to "pain management": a. General palliative care, b. General pain management, c. Characteristics of non-opioid analgesics, d. Characteristics of opioid analgesics, e. Adverse effects of opioid analgesics, f. Dependence and tolerance of opioid analgesics, g. Analgesic adjuvant, h. Radiotherapy, i. Nerve block, j. Physiotherapy approach.

2. "Other symptoms management"

The following six classes are related to "other symptoms management": a. Respiratory symptoms of the terminal stage, b. Gastrointestinal symptoms of the terminal stage, c. Urological symptoms of the terminal stage, d. Fluid therapy for the terminal stage, e. Psychiatric symptom management, f. Sedation to relieve pain.

3. "Medical cooperation"

The following eight classes are related to "medical collaboration": a. Role of physician in charge of physical symptoms, b. Role of physician in charge of mental symptoms, c. Role of nursing for palliative care, d. Role of nutritionist, e. Role of medical social worker (MSW), f. Role of home doctor, g. Role of home pharmacist, h. Role of palliative care team.

4.4. Questionnaire survey

We used the linkable anonymizing method to check responses to the questionnaire. Thus, the participants accepted that their data were publicized.

4.4.1. Investigation of subjective comprehension degree on each class

Questionnaires were prepared (Table 3) and conducted to determine comprehension degree before and after the attendance of each class. The questionnaires were conducted before the class started and after the class finished. Comprehension degree was recorded as a ten-level indication, where 1 represented "I do not understand at all" and 10 represented "I understand enough."

4.4.2. Survey throughout the workshop

We prepared questionnaires for the survey (Table 4). We investigated pharmacists' age, years of experience as a pharmacist, workplace, qualification status as a BCPBP, and anxiety over obtaining BCPBP qualification. The questionnaires were performed before the start and after the end of workshops.

4.4.3. Exclusion criteria

We compared only clear answers before and after attendance. When respondents did not answer some questions, we excluded their data.

4.4.4. Statistical analysis

All statistical analyses were performed with EZR (Saitama Medical Center, Jichi Medical University, Saitama, Japan) (Kanda, 2013 #278), which is a graphical user interface for R (The R Foundation for Statistical Computing, Vienna, Austria). More precisely, it is a modified version of R commander designed to add statistical functions frequently used in biostatistics. Fisher's exact probability test was conducted to compare scores of anxiety over obtaining BCPBP qualification, and the Wilcoxon signed-rank test was used to compare scores of degree of comprehension of each class. *P* values of less than 0.05 were considered to indicate statistically significant differences.

Acknowledgements: We thank the participants of this palliative care workshop who cooperated in the questionnaire survey for this study.

Conflicts of interests: The authors declare that they have no competing interests.

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