

# Japanese Nationwide Comparative Survey of Medication Guidance Provided by Certified and Uncertified Palliative Care Pharmacists

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**Background:** As members of a medical team, pharmacists are expected to provide optimal patient-centered, evidence-based pharmacotherapy. In Japan, in consideration of the importance of palliative care, a system was initiated for certifying palliative care pharmacists in 2010. However, no studies have evaluated the usefulness of board certification in palliative pharmacy. Therefore, we surveyed the status of medication guidance for the physical and psychological symptoms of patients receiving palliative care and compared the medication guidance provided by certified and uncertified pharmacists.

**Methods:** The survey was conducted in February and March 2022. Pharmacists registered as members of the Japanese Society of Pharmaceutical Palliative Care and Sciences were surveyed by using a web-based questionnaire and 209 pharmacists responded: the certified pharmacist group comprised 123 (58.9%) pharmacists and the uncertified pharmacist group comprised 86 (41.1%) pharmacists.

**Results:** The certified pharmacist group provided better and more frequent medication guidance, according to responses to four of the six items related to pain relief. Three items were related to non-pain symptom relief, and one of the four items was related to psychiatric symptom relief ( $P < 0.05$ ). The study showed that the certified pharmacist group received a better rating than the uncertified pharmacist group for involvement in palliative pharmacotherapy leading to improvement of patient quality of life ( $P < 0.05$ ).

**Conclusion:** As compared with uncertified pharmacists, certified pharmacists intervened more proactively and provided a broader range of palliative care. (J Nippon Med Sch 2023; 90: 449–459)

**Key words:** palliative care, pharmacists, drug utilization review, certification

## Introduction

Persons with cancer experience a variety of physical, emotional, and social challenges. Among them, pain is not only a common symptom of cancer but also one that

can significantly impact patient quality of life (QOL)<sup>1,2</sup>. Therefore, opioid-based pharmacotherapy is important in palliative care. In addition, multidisciplinary team medicine is essential in addressing the suffering of patients

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[https://doi.org/10.1272/jnms.JNMS.2023\\_90-613](https://doi.org/10.1272/jnms.JNMS.2023_90-613)

Journal Website (<https://www.nms.ac.jp/sh/jnms/>)

Table 1 Requirements for board certification as a pharmacist in palliative pharmacy

item	requirement	
Number of years working as pharmacist	More than 5 years	
Number of years working in palliative care	More than 3 years	
Case postings related to palliative care	Hospital affiliation	30 cases
	Pharmacy affiliation	15 cases
Number of credits required to attend courses specified by the Japanese Society of Pharmaceutical Palliative Care and Sciences	Total 100 credits or more (20 credits or more/each year)	
Conference presentations related to palliative care	More than 2 times (At least once, as the first presenter)	
Examination of knowledge of palliative pharmacy	Passing mark or higher	

with cancer. As members of a medical team, pharmacists are expected to play a role in providing optimal patient-centered, evidence-based palliative pharmacotherapy by assessing patients' physical and mental symptoms from a pharmacological perspective<sup>3,4</sup>. In a Korean study, a prescribing intervention by a pharmacist in a palliative care team optimized use of analgesics and improved pain control in cancer patients<sup>5</sup>. In addition, a Chinese report suggested that pharmacist-led palliative care team interventions help standardize cancer pain treatment, improve pain management, reduce adverse events, and improve QOL for cancer patients<sup>6</sup>. Thus, inclusion of pharmacists on palliative care teams enables them to provide more appropriate palliative pharmacotherapy<sup>7-9</sup>. Furthermore, pharmacists are required to have greater expertise in palliative care, to address various types of pain in cancer patients<sup>10,11</sup>.

Acknowledgement of the importance of palliative medicine led to the establishment of the Japanese Society of Pharmaceutical Palliative Care and Sciences in 2007, and a system for board certification of pharmacists in palliative pharmacy began in 2010. The main objective of the certification system is to foster pharmacists who understand the spirit of palliative medicine and contribute to patient care, together with physicians, nurses, and other healthcare professionals, by acquiring knowledge of palliative pharmacy. To obtain accreditation, the applicant must have a track record of continuous intervention in palliative medicine and satisfy multiple requirements, including case presentation, research activities, and passing an accreditation examination<sup>12</sup> (Table 1).

In Japan, healthcare workers with palliative and oncology-related certifications performed better than uncertified workers in reducing inappropriate polypharmacy and associated adverse events<sup>13</sup>. However, no studies have evaluated the usefulness of credentials in addressing the physical and psychological symptoms of pa-

tients receiving palliative care. Globally, outcomes have been reported by pharmacists with qualifications and education in palliative care; however, no studies have compared healthcare workers with and without qualifications or exposure to educational programs<sup>10,14,15</sup>. We believe that clarifying differences in treatment interventions of pharmacists with and without certification will help define the contribution of pharmacists with board certification in palliative pharmacy (hereafter referred to as "certified pharmacists") and assist in establishing appropriate educational programs. As the number of cancer patients increases with the aging of the population, frequent interventions by certified pharmacists may alleviate the shortage of healthcare providers needed to treat cancer patients<sup>16,17</sup>. To clarify these issues, we surveyed pharmacists affiliated with the Japanese Society of Palliative Medicine and Pharmacotherapy to determine the status of medication guidance for physical and psychological symptoms of patients receiving palliative pharmacotherapy. In addition, we compared the actual status of medication guidance provided by certified and uncertified pharmacists.

## Materials and Methods

### Survey Method

The survey period was February through March 2022. Pharmacists registered as members of the Japanese Society of Pharmaceutical Palliative Care and Sciences as of February 1, 2022, were surveyed. All members were asked to participate in the survey via e-mail, and a web-based survey was conducted using Google Forms (Google Inc., USA). The responses were anonymous and in a form that did not allow for identification of individuals.

### Questionnaire Items

Items Q1 through Q22 were administered to the pharmacists (Supplement 1: [https://doi.org/10.1272/jnms.JNMS.2023\\_90-613](https://doi.org/10.1272/jnms.JNMS.2023_90-613)).

**Background Characteristics of Pharmacists (Q1-Q7)**

In Q1, consent to participate in the study was obtained. Q2 asked whether a pharmacist had obtained palliative pharmacy certification. In Q3, respondents were asked to choose whether they belonged to A (hospital), B (pharmacy), or C (other). In Q4, respondents were asked to indicate their years of work experience by selecting one of four options: A, less than 1 year; B, 1 to 3 years; C, 4 to 10 years; and D, 11 years or more. In Q5, respondents were asked about the status of intervention guidance in the past year by selecting one of the following three options: A: the intervention was conducted routinely and directly, B: the intervention was conducted indirectly through conferences, without seeing the patient, and C: no intervention was conducted. In Q6, respondents were asked about their affiliation with a palliative care team by selecting one of the following three options: A: you belong to a palliative care team at your facility; B: you do not belong to a palliative care team at your facility; and C: your facility does not have a palliative care team. Finally, in Q7, we surveyed calculation of the additional narcotic instruction fee, which can be calculated when a pharmacist dispenses a prescription narcotic and provides pharmacological management and guidance to the patient regarding drug administration, storage conditions, and side effects. One of the following four options was selected: A: routinely calculates the additional narcotics instruction fee; B: occasionally calculates the additional narcotics instruction fee; C: infrequently calculates the additional narcotics instruction fee; and D: never or rarely calculates the additional narcotics instruction fee.

**Intervention Guidance in Pain Relief (Q8-Q13)**

Q8: Do you intervene in drug selection at the time of the initial opioid prescription (e.g., use of weak or strong opioids according to pain status; consideration of renal and hepatic dysfunction)? Q9: Do you provide medication guidance during opioid administration? Q10: Do you provide ongoing interventions (e.g., pain assessment and dose adjustment; addition or reduction of laxatives and antiemetics) after opioid induction? Q11: Do you suggest switching medications in the event of inadequate opioid efficacy or adverse drug reactions? Q12: Do you offer methadone suggestions, drug management, or medication guidance during opioid switching? Q13: Do you provide dose adjustment, drug administration, and medication guidance for opioid injections (in-home healthcare for pharmacies; even when the patient is unconscious, if you go directly to the patient to check their condition, you are considered to be intervening)? These

questions were surveyed on a five-point scale as follows: A: I routinely intervene regardless of requests from physicians, nurses, patients, etc. B: I occasionally intervene when requested by physicians, nurses, patients, etc. C: I intervene infrequently and not often at the request of physicians, nurses, etc. D: I never or rarely intervene. E: I have no patients for whom to intervene because of my current area of responsibility or ward assignment.

**Intervention Guidance in Relieving Symptoms Other than Pain (Q14-Q16)**

Q14: Do you intervene when respiratory distress symptoms (cough, shortness of breath, etc.) occur in cancer patients by suggesting drug therapy using opioids or other drugs, adjusting doses, confirming concomitant precautions or contraindications, confirming side effects, and transitioning to nonpharmacologic therapy? Q15: Do you intervene for ascites, ileus, or abdominal distention in cancer patients by suggesting drug therapy, adjusting doses, confirming concomitant precautions or contraindications, confirming side effects, or transitioning to nonpharmacological therapy? Q16: Do you intervene for urinary symptoms (frequent urination, dysuria, urinary retention, etc.) in cancer patients by suggesting drug therapy, adjusting doses, confirming concomitant precautions or contraindications, confirming side effects, and transitioning to nonpharmacological therapy?

These questions were surveyed on a five-point scale as follows: A: I routinely intervene regardless of requests from physicians, nurses, patients, etc. B: I occasionally intervene when requested by physicians, nurses, patients, etc. C: I intervene infrequently and not often at the request of physicians, nurses, etc. D: I never or rarely intervene. E: I have no patients for whom to intervene because of my current area of responsibility or ward assignment.

**Intervention Guidance in Alleviating Psychiatric Symptoms (Q17-Q20)**

Q17: Do you intervene at the onset of delirium in cancer patients by suggesting pharmacotherapy with antipsychotics, dose adjustment, confirming concomitant precautions or contraindications, confirming side effects, and transitioning to nonpharmacologic therapy? Q18: Do you provide preventive interventions for delirium in patients with cancer, such as discontinuing benzodiazepine agonists and other risk-increasing drugs? Q19: Do you intervene in insomnia in cancer patients by suggesting drug therapy, adjusting doses, checking for side effects, checking for concomitant precautions or contraindications, and transitioning to nonpharmacologic therapy?

Q20: Do you intervene in depression in cancer patients by suggesting drug therapy, adjusting doses, confirming concomitant precautions or contraindications, confirming side effects, and transitioning to nonpharmacologic therapy?

These questions were surveyed on a five-point scale as follows: A: I routinely intervene regardless of requests from physicians, nurses, patients, etc. B: I occasionally intervene when requested by physicians, nurses, patients, etc. C: I intervene infrequently and not often at the request of physicians, nurses, etc. D: I never or rarely intervene. E: I have no patients for whom to intervene because of my current area of responsibility or ward assignment.

#### **Other Intervention Guidance (Q21-Q22)**

In Q21, pharmacists were asked to rate their subjective contribution to improving patient QOL on a 5-point scale as follows: A: For most patients, I rate their QOL as improved. B: For nearly half of patients, I rate their QOL as improved. C: For a few patients, I rate their QOL as improved. D: For almost all patients, QOL neither improved nor worsened. E: QOL worsened. In Q22, the respondents were asked if they had provided other intervention guidance.

#### **Exclusion Criteria**

Responses by persons not engaged in pharmacy work and incomplete responses were excluded from the analysis.

#### **Statistical Analysis**

On the basis of responses to Q2, respondents were classified as certified and uncertified. Fisher's direct test was used for responses to Q3, and Cochran-Armitage analysis was used for responses to Q4 through Q7 to compare the background factors of the survey respondents. To compare the intervention status of certified and uncertified pharmacists, Cochran-Armitage analysis was performed on the five levels of responses from Q8 to Q21. The expected factors influencing the results were years of experience and affiliation with a palliative care team. Therefore, we conducted a subgroup analysis limited to pharmacists with 11 or more years of experience and pharmacists affiliated with a palliative care team, and limited the analysis to items in Q8-Q21 with a significant difference between the two groups. The significance level for all tests was set at 5%, and Bell Curve for Excel (Social Survey Research Information Co., Ltd., Tokyo, Japan) was used for analysis.

#### **Ethical Considerations**

This study was conducted in compliance with the Ethical

Guidelines for Medical Research Involving Human Subjects and was approved by the ethical review committee of Kanazawa University (approval number: 113813-1).

## **Results**

### **Background Characteristics of Pharmacists (Q1-Q7)**

The background characteristics of the respondents are shown in **Table 2**. The questionnaire was distributed to 3,854 members of the Japanese Society of Pharmaceutical Palliative Care and Sciences as of February 1, 2022 (739 certified pharmacists), and 210 responses were received with study consent. Of these, one response with incomplete information on years of experience was excluded, and 209 responses were tabulated. The certified pharmacist group consisted of 123 (58.9%) pharmacists, and the uncertified pharmacist group consisted of 86 pharmacists (41.1%). As compared with the uncertified group, the certified group had significantly higher rates of hospital affiliation, years of pharmacist experience, and palliative care team affiliation.

### **Frequency of Intervention by Pharmacists (Q8-Q20)**

The frequency of pharmacist intervention in palliative care is shown in **Table 3**. Of the 13 items, from Q8 to Q20, the certified group more frequently provided medication guidance for the four items (Q8, Q10, Q11, and Q13) related to pain relief, all items related to relief of symptoms other than pain, and one item (Q18) related to psychiatric symptom relief.

### **Subjective Evaluation of Improvement in Patient QOL (Q21)**

Regarding whether pharmacists' intervention in palliative pharmacy improved patient QOL, the certified group rated patient QOL as significantly better. The number of responses of "E: QOL worsened" was zero for both the certified and uncertified groups.

### **Other Interventions (Q22)**

Thirteen responses were received from the certified group. These included psychological and spiritual care for patients and families (5), medical collaboration with other professions (3), improvement of polypharmacy (2), infection control (1), nutrition management (1), and changes in dosage according to medication status (1). Seven responses were received from the uncertified group. These included medical collaboration with other professions (3), psychological and spiritual care for patients and families (2), and nutrition management (2).

### **Subgroup Analysis**

Subgroup analyses were performed for Q8, Q10, Q11,

Table 2 Background of responding pharmacists

		board certified pharmacist in palliative pharmacy		<i>P</i>
		certified pharmacist group (n=123)	non-certified pharmacist group (n=86)	
Affiliation (Hospital/Pharmacy)	Hospital	103	57	0.005 <sup>a</sup>
	Pharmacy	20	29	
Number of years working as pharmacist	Less than 1 year	0	0	<0.001 <sup>b</sup>
	1-3 years	0	2	
	4-10 years	12	30	
	More than 11 years	111	54	
Status of intervention guidance	Direct intervention	107	70	0.245 <sup>b</sup>
	Indirect intervention by conference	10	8	
	No intervention	6	8	
Participation on the palliative care team at your facility	Participating	95	45	<0.001 <sup>a</sup>
	Not participating	11	14	
	No palliative care team at your facility	17	27	
Calculation of the additional narcotic instruction fee	Routinely	62	36	0.582 <sup>b</sup>
	Occasionally	20	21	
	Infrequently	4	5	
	Never or rarely	37	24	

<sup>a</sup> Fisher's exact test

<sup>b</sup> Cochran-Armitage analysis

Q13, Q14, Q15, Q16, Q18, and Q21, for which significant differences were found in the overall analysis. **Table 4** shows the results of the analysis limited to pharmacists with 11 or more years of experience, and **Table 5** shows the results of the analysis limited to pharmacists on a palliative care team.

### Discussion

This is the first study to compare interventions in palliative care by certified and uncertified pharmacists. Certified pharmacists actively and extensively intervened in providing palliative care. Responses related to pain relief (Q8-13, except Q12) indicated that both certified and uncertified pharmacists were likely to intervene routinely or occasionally. Responses regarding physical and psychological symptoms other than pain (Q14-20) showed that the highest percentage of routine interventions was for pain relief. A similar trend was reported in previous studies of palliative pharmacy education in Japan<sup>18</sup>. Other countries have reported that pharmacists are more likely to actively intervene for pain relief treatment than for other treatments/conditions<sup>19</sup>. These findings suggest that pharmacist knowledge and interest is greater for pain treatment (the basis of palliative pharmacy) than for treatment of other physical or mental conditions.

In the present survey, a high percentage of certified and uncertified pharmacists routinely intervened at the time of opioid introduction (Q9). The certified group tended to intervene more actively than the uncertified group for other items. This suggests that both certified and uncertified pharmacists are able to intervene to some extent in opioid introduction. However, certified pharmacists can intervene more routinely/efficiently than the uncertified group when expertise is needed, such as in drug selection or follow-up. However, for interventions involving methadone (Q12), an extremely high percentage of respondents, irrespective of certification status, had no experience with the intervention or were not contacted by eligible patients. Pharmacists are required to attend a training course and register with a physician to prescribe this drug in Japan<sup>20</sup>. This greatly affects physicians, as they must consider constraints related to prescribing the drug. Since knowledge of methadone is tested in the certification exam, certified pharmacists are confident while prescribing it, but they need ongoing seminars to supplement their knowledge because of their limited clinical experience.

According to all responses regarding relief of physical symptoms other than cancer pain (Q14-16), the certified group was more likely than the uncertified group to rou-



Table 3-1 Comparison of frequency of intervention and subjective contribution to improving quality of life (QOL) of patients

Question	Answer	Certified pharmacist group n (%)	Uncertified pharmacist group n (%)	P
Q8. Drug selection for initial opioid prescription	Routinely	63 (51)	33 (38)	0.035
	Occasionally	43 (35)	32 (37)	
	Not often	6 (5)	9 (10)	
	Never or very few	4 (3)	6 (7)	
	No applicable patients	7 (6)	6 (7)	
Q9. Medication guidance during opioid induction	Routinely	79 (64)	60 (70)	0.523
	Occasionally	27 (22)	13 (15)	
	Not often	5 (4)	3 (3)	
	Never or very few	2 (2)	3 (3)	
	No applicable patients	10 (8)	7 (8)	
Q10. Ongoing interventions after opioid induction	Routinely	94 (76)	54 (63)	0.026
	Occasionally	19 (15)	17 (20)	
	Not often	2 (2)	3 (3)	
	Never or very few	2 (2)	6 (7)	
	No applicable patients	6 (5)	6 (7)	
Q11. Suggesting opioid switching	Routinely	82 (67)	42 (49)	0.008
	Occasionally	29 (24)	27 (31)	
	Not often	3 (2)	7 (8)	
	Never or very few	3 (2)	5 (6)	
	No applicable patients	6 (5)	5 (6)	
Q12. Interventions for methadone	Routinely	23 (19)	11 (13)	0.152
	Occasionally	21 (17)	8 (9)	
	Not often	11 (9)	8 (9)	
	Never or very few	21 (17)	23 (27)	
	No applicable patients	47 (38)	36 (42)	
Q13. Interventions for opioid injections	Routinely	79 (64)	37 (43)	0.003
	Occasionally	24 (20)	23 (27)	
	Not often	3 (2)	3 (3)	
	Never or very few	5 (4)	12 (14)	
	No applicable patients	12 (10)	11 (13)	

tinely intervene. Thus, certified pharmacists intervene in a variety of treatment areas. However, among certified pharmacists the percentage of routine interventions for treatment of urological symptoms was 37%, lower than the percentage of routine interventions for treatment of respiratory distress and ascites (59% and 50%, respectively). Previous studies of palliative pharmacotherapy education for pharmacists identified knowledge of palliative pharmacotherapy methods related to urology as insufficient<sup>18</sup>. Reports show that the number of pharmacist interventions for polypharmacy in cancer patients<sup>13,21</sup> was too low. The Japanese Society of Pharmaceutical Palliative Care and Sciences offers twice-yearly educational seminars (eight credits per seminar) on pain relief, relief of symptoms other than pain, and relief of psychiatric symptoms, through which certified pharmacists can earn

credits. The number of lectures on management of urological symptoms should be increased at these educational seminars and other workshops.

As indicated by the responses regarding symptom relief of psychiatric symptoms of delirium (Q17, 18), the certified group intervened more often than the uncertified group, suggesting that certified pharmacists have a greater awareness of interventions for delirium in cancer patients. According to previous reports, antiemetic agents and gastrointestinal agents, followed by benzodiazepines that induce delirium<sup>22,23</sup>, are the most common drugs pharmacists suggest to withdraw when addressing polypharmacy in cancer patients. Certified pharmacists also contribute to the reduction of inappropriate prescriptions in patients receiving multiple opioid medications<sup>13</sup>. These factors suggest that medication optimization by

Table 3-2 Comparison of frequency of intervention and subjective contribution to improving quality of life (QOL) of patients

Question	Answer	Certified pharmacist group n (%)	Uncertified pharmacist group n (%)	P
Q14. Intervene for respiratory distress symptoms	Routinely	72 (59)	33 (38)	0.001
	Occasionally	37 (30)	30 (35)	
	Not often	4 (3)	6 (7)	
	Never or very few	3 (2)	10 (12)	
	No applicable patients	7 (6)	7 (8)	
Q15. Intervene for ascites, ileus, or abdominal distention	Routinely	62 (50)	25 (29)	<0.001
	Occasionally	36 (29)	24 (28)	
	Not often	12 (10)	20 (23)	
	Never or very few	4 (3)	11 (13)	
	No applicable patients	9 (7)	6 (7)	
Q16. Intervene for urinary symptoms	Routinely	45 (37)	17 (20)	<0.001
	Occasionally	34 (28)	20 (23)	
	Not often	26 (21)	22 (26)	
	Never or very few	7 (6)	17 (20)	
	No applicable patients	11 (9)	10 (12)	
Q17. Intervene for delirium at the onset	Routinely	56 (46)	28 (33)	0.062
	Occasionally	44 (36)	35 (41)	
	Not often	8 (7)	8 (9)	
	Never or very few	4 (3)	9 (10)	
	No applicable patients	11 (9)	6 (7)	
Q18. Preventive interventions for delirium	Routinely	64 (52)	34 (40)	0.034
	Occasionally	37 (30)	25 (29)	
	Not often	11 (9)	14 (16)	
	Never or very few	2 (2)	8 (9)	
	No applicable patients	9 (7)	5 (6)	
Q19. Intervene for insomnia	Routinely	65 (53)	42 (49)	0.380
	Occasionally	38 (31)	23 (27)	
	Not often	8 (7)	9 (10)	
	Never or very few	2 (2)	7 (8)	
	No applicable patients	10 (8)	5 (6)	
Q20. Intervene for depression	Routinely	40 (33)	18 (21)	0.084
	Occasionally	43 (35)	30 (35)	
	Not often	18 (15)	19 (22)	
	Never or very few	8 (7)	14 (16)	
	No applicable patients	14 (11)	5 (6)	
Q21. Improving the QOL of patients	Majority improved	47 (38)	25 (29)	0.005
	Nearly half improved	61 (50)	32 (37)	
	A few improved	12 (10)	24 (28)	
	QOL did not worsen.	3 (2)	5 (6)	
	QOL worsened.	0 (0)	0 (0)	

certified pharmacists helps prevent and treat delirium. For depression (Q20), the responses of certified and uncertified groups indicated that their interventions may not be adequate. In a previous report outside Japan, Inderlall et al.<sup>24</sup> surveyed pharmacy and hospital pharmacists regarding the role of pharmacists in palliative care. Interventions for treatment of psychological symptoms

were less frequent than interventions for treatment of pain relief. In a survey of pharmacist knowledge of palliative pharmacy by O'Connor et al.<sup>25</sup>, the percentage of correct answers to questions on depression tended to be lower than the percentage of correct answers to questions on pain relief. These findings suggest a need for pharmacist education programs targeting treatment of psychiat-

Table 4 Subgroup analysis of pharmacists with 11 or more years of experience

Question	Answer	Certified pharmacist group n (%)	Uncertified pharmacist group n (%)	P
Q8. Drug selection for initial opioid prescription	Routinely	60 (54)	20 (37)	0.019
	Occasionally	36 (32)	19 (35)	
	Not often	5 (5)	6 (11)	
	Never or very few	3 (3)	5 (9)	
	No applicable patients	7 (6)	4 (7)	
Q10. Ongoing interventions after opioid induction	Routinely	85 (77)	32 (59)	0.017
	Occasionally	17 (15)	11 (20)	
	Not often	2 (2)	3 (6)	
	Never or very few	1 (1)	5 (9)	
	No applicable patients	6 (5)	3 (6)	
Q11. Suggesting opioid switching	Routinely	74 (67)	27 (50)	0.030
	Occasionally	26 (23)	16 (30)	
	Not often	3 (3)	4 (7)	
	Never or very few	2 (2)	4 (7)	
	No applicable patients	6 (5)	3 (6)	
Q13. Interventions for opioid injections	Routinely	70 (63)	21 (39)	0.003
	Occasionally	22 (20)	14 (26)	
	Not often	3 (3)	3 (6)	
	Never or very few	5 (2)	9 (17)	
	No applicable patients	11 (10)	7 (13)	
Q14. Intervene for respiratory distress symptoms	Routinely	63 (57)	21 (39)	0.011
	Occasionally	36 (32)	18 (26)	
	Not often	3 (3)	5 (9)	
	Never or very few	2 (2)	7 (13)	
	No applicable patients	7 (6)	3 (6)	
Q15. Intervene for ascites, ileus, or abdominal distention	Routinely	54 (49)	17 (31)	0.014
	Occasionally	35 (32)	16 (30)	
	Not often	9 (8)	9 (17)	
	Never or very few	4 (4)	9 (17)	
	No applicable patients	9 (8)	3 (6)	
Q16. Intervene for urinary symptoms	Routinely	41 (37)	10 (19)	0.006
	Occasionally	33 (30)	16 (30)	
	Not often	20 (18)	11 (20)	
	Never or very few	6 (5)	10 (19)	
	No applicable patients	11 (10)	7 (13)	
Q18. Preventive interventions for delirium	Routinely	60 (54)	17 (31)	0.011
	Occasionally	32 (29)	22 (45)	
	Not often	8 (7)	7 (13)	
	Never or very few	2 (2)	6 (11)	
	No applicable patients	9 (8)	2 (4)	
Q21. Improving the QOL of patients	Majority improved	46 (41)	20 (37)	0.086
	Nearly half improved	51 (46)	17 (31)	
	A few improved	12 (11)	13 (24)	
	QOL did not worsen.	2 (2)	4 (7)	
	QOL worsened.	0 (0)	0 (0)	

ric symptoms (especially depressive symptoms).

Certified pharmacists were more involved than uncertified pharmacists in improving patient QOL. A survey of

hospital pharmacists in Nigeria found that pharmacists with palliative care training were more familiar with palliative care pain symptoms than were those without such



Table 5 Subgroup analysis of pharmacists affiliated with palliative care teams

Question	Answer	Certified pharmacist group n (%)	Uncertified pharmacist group n (%)	P
Q8. Drug selection for initial opioid prescription	Routinely	54 (57)	19 (41)	0.132
	Occasionally	34 (36)	22 (49)	
	Not often	4 (4)	3 (7)	
	Never or very few	1 (1)	1 (2)	
	No applicable patients	2 (2)	0 (0)	
Q10. Ongoing interventions after opioid induction	Routinely	77 (81)	32 (71)	0.192
	Occasionally	15 (16)	11 (24)	
	Not often	1 (4)	1 (1)	
	Never or very few	0 (0)	0 (0)	
	No applicable patients	2 (2)	1 (2)	
Q11. Suggesting opioid switching	Routinely	70 (74)	24 (53)	0.017
	Occasionally	22 (23)	18 (40)	
	Not often	1 (1)	3 (7)	
	Never or very few	0 (0)	0 (0)	
	No applicable patients	2 (2)	0 (0)	
Q13. Interventions for opioid injections	Routinely	70 (74)	25 (56)	0.025
	Occasionally	19 (20)	13 (29)	
	Not often	1 (1)	3 (7)	
	Never or very few	3 (3)	2 (4)	
	No applicable patients	2 (2)	2 (4)	
Q14. Intervene for respiratory distress symptoms	Routinely	61 (64)	18 (40)	0.003
	Occasionally	30 (32)	19 (42)	
	Not often	1 (1)	5 (11)	
	Never or very few	1 (1)	1 (2)	
	No applicable patients	2 (2)	2 (4)	
Q15. Intervene for ascites, ileus, or abdominal distention	Routinely	54 (57)	15 (33)	0.003
	Occasionally	30 (32)	16 (36)	
	Not often	7 (7)	11 (24)	
	Never or very few	1 (1)	2 (4)	
	No applicable patients	3 (3)	1 (2)	
Q16. Intervene for urinary symptoms	Routinely	40 (57)	10 (22)	0.003
	Occasionally	30 (32)	12 (27)	
	Not often	16 (17)	13 (29)	
	Never or very few	5 (5)	8 (18)	
	No applicable patients	4 (4)	2 (4)	
Q18. Preventive interventions for delirium	Routinely	54 (57)	20 (44)	0.092
	Occasionally	30 (32)	14 (31)	
	Not often	7 (7)	9 (20)	
	Never or very few	1 (1)	1 (2)	
	No applicable patients	3 (3)	1 (2)	
Q21. Improving the QOL of patients	Majority improved	39 (41)	14 (31)	0.089
	Nearly half improved	44 (46)	19 (42)	
	A few improved	10 (11)	12 (27)	
	QOL did not worsen	2 (2)	0 (0)	
	QOL worsened	0 (0)	0 (0)	

training. The report further stated that palliative care training can instill confidence and other necessary skills for pharmacists, which allows them to function effec-

tively as competent members of a palliative care team<sup>26</sup>. These findings suggest that certification increases the confidence of pharmacists dealing with patients receiving

palliative care. Pharmacists working in hospitals and pharmacies are required to submit 30 and 15 cases, respectively, as a condition of certification. The proactive intervention of certified pharmacists with this experience may have contributed to improving the QOL of patients.

Since the goals of this study were to evaluate the usefulness of certified pharmacists and improve educational program of the society in areas of low usefulness, pharmacists belonging to the academic society were targeted. Therefore, the study has several limitations. First, the survey was conducted among pharmacists affiliated with the Japanese Society of Pharmaceutical Palliative Care and Sciences, and respondents, whether certified or not, likely had a high level of interest in palliative medicine. Expanding the survey scope to include general pharmacists could clarify the usefulness and significance of obtaining certification. Second, the duration of work experience differed between the two groups, which could have affected the quality and quantity of interventions. However, as indicated by the certification requirements, the results may reflect the actual clinical situation in which obtaining certification in palliative pharmacotherapy is not possible without sufficient experience. A comparison of the results in **Table 3, 4** indicates better overall intervention behavior for pharmacists with 11 or more years of experience. However, certified pharmacists were more proactive in their intervention. The reason why Q21 no longer indicated a significant difference may be that the number of responses was smaller and the power of detection decreased. Third, the certified group had higher rates of hospital and palliative care team affiliation than did the uncertified group. In general, hospital pharmacists have better access to patient information, such as blood test data, than do pharmacists at pharmacies. In addition, according to previous reports, hospital pharmacists intervened more frequently than pharmacy pharmacists in cases of polypharmacy<sup>13,21</sup>. Furthermore, a questionnaire survey of the clinical, educational, and research activities of pharmacists affiliated with palliative care teams showed that the number of interventions related to pain and physical symptoms other than the pain was almost equal<sup>27</sup>. Pharmacists belonging to palliative care teams have more opportunities than other pharmacists to treat patients who need palliative care. The quality of interventions by certified pharmacists is evaluated by presenting intervention cases, which is a certification requirement. In the certification exam, a case presentation that relies completely on a palliative care team member other than the pharmacist himself/herself is not consid-

ered successful. Therefore, it can be expected that a certain quality of intervention is ensured if it is limited to certified pharmacists. In contrast, for an uncertified pharmacist who is a member of a palliative care team, it is difficult to determine whether the intervention was performed by the pharmacist or was dependent on other team members. The subgroup analysis results in **Table 5** show several items for which no significant differences were found. Palliative care team affiliation had a greater effect on intervention status than years of experience. However, even among these items, certified pharmacists were more aggressive than uncertified pharmacists in their interventions. Finally, the target disease was primarily cancer. Palliative care was introduced in Japan for terminal cancer patients and has since been developed for all types of cancer<sup>28</sup>. However, given the importance of palliative care for non-cancer patients, such as those with heart failure or HIV/AIDS, it is necessary to focus on research, education, and training in palliative pharmacotherapy for non-cancer patients. Fourth, our study investigated the frequency of pharmacist interventions and is a subjective assessment.

These background factors may have been confounding factors in this study. However, this large-scale study is the first to show that certified pharmacists intervene more actively than uncertified pharmacists in broad palliative care areas.

### Conclusions

Pharmacists affiliated with the Japanese Society of Pharmaceutical Palliative Care and Sciences were surveyed regarding their interventions for treatment of physical and psychological symptoms of patients receiving palliative pharmacotherapy. A comparison revealed that the interventions of certified pharmacists were more effective than those of uncertified pharmacists in treating patients receiving palliative care.

**Acknowledgements:** Not applicable.

**Conflict of Interest:** None declared.

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(Received, December 10, 2022)

(Accepted, May 22, 2023)

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