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ORIGINAL ARTICLE

Randomized controlled trial of standardized education and telemonitoring for pain in outpatients with advanced solid tumors

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Abstract

Purpose Previous studies have not defined the role of telemonitoring with educational tools in outpatients with advanced cancers. We tested the effectiveness of standardized education and telemonitoring for improving pain, distress, anxiety, depression, quality of life (QoL), and performance in outpatients with advanced cancers.

Methods A total of 108 patients were randomly assigned to receive pain education alone (control arm) or pain education plus telemonitoring (experimental arm). Nursing specialists provided video-assisted educational material in both arms and daily telemonitoring for the first week in the experimental arm. Assessment was performed at baseline and 1 week and included evaluations of pain (Brief Pain Inventory, BPI), distress (Distress Thermometer, DT), anxiety, and depression (Hospital Anxiety and Depression Scale, HADS), QoL (QLQ-C30), and a Karnofsky score.

Results Overall (n=108), pain intensity was significantly improved at 1 week, including worst pain (7.3 to 5.7, P<0.01) and average pain (4.6 to 3.8, P<0.01). Additionally, anxiety (HADS score≥11, 75 % to 56 %, P<0.01), depression (HADS score≥11, 73 % to 51 %, P<0.01), QoL (fatigue and insomnia), and the Karnofsky score (32 to 66, P<0.01) were also significantly improved at 1 week. However, the level of distress did not improve. The telemonitoring plus standardized education group showed more significant improvement in portion of pain >4 on VAS scale (35 % vs. 19 %, P=0.02).

Conclusions Standardized pain education using nursing specialists is an efficient way to improve not only pain itself but also anxiety, depression, performance, and QoL. The addition of telemonitoring helps to improve pain management in the outpatient setting.

Keywords Cancer · Pain · Care management · Telemonitoring · Quality of life

Introduction

Pain is one of the most common symptoms in patients with advanced cancer, and more than one-third of patients with pain rate it as moderate or severe [1]. Despite the existence of well-documented guidelines for cancer pain [2-4], nearly 50 % of patients are undertreated [5]. Unrelieved pain is associated with significant functional impairment, increased anxiety and depression, reduced quality of life (QoL) and might induce suicidal attempts [6-9].

Several factors have been identified as the main obstacles to relieving cancer pain and can be categorized according to patient, professional, and system perspectives [4, 7, 10-14]. Patients may be reluctant to communicate with physicians

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about pain because they consider the pain to represent progression of cancer, they may fear addiction or side effects of medications, and they may desire to be good patients. Physicians and nurses are not familiar with the principles of pain management and have insufficient time.

Educational interventions including videos and booklets have been applied to patients in previous research studies in order to overcome barriers to controlling cancer-related pain [14-17, 18-20]. Oliver et al. reported single exposure of individualized pain education could improve pain control in cancer outpatients [15]. Miaskowski et al. (1, 2, 4, and 5 weeks) and Yates et al. (1 and 2 weeks) provided multiple education sessions to enable self-care in pain control [16, 17]. Syrjala et al. utilized video tools with print materials [18]. These self-administered educational tools composed of a booklet and video helped patients to improve their knowledge and to actively cope with pain management. Recently, telecare management has been shown to improve pain and depression in patients with cancer [21]. Kroenke et al. improved patient outcomes in pain and depression through multiple education sessions regarding both pain and depression management, combined with telemonitoring (1, 4, and 12 weeks). However, previous studies have not defined the role of telemonitoring with standardized educational tools in outpatients with advanced cancer. More than 80 % of the patients with advanced cancer suffer from pain [4, 7], and there is insufficient time in outpatient clinics and it is difficult to conduct short-term follow-up; therefore, telemonitoring with educational tools may be effective in palliative and outpatient settings. In this study, our purpose was to evaluate whether standardized educational tools with or without telemonitoring in outpatients with advanced tumors could improve pain levels, pain interference, anxiety, depression, distress, performance, and QoL.

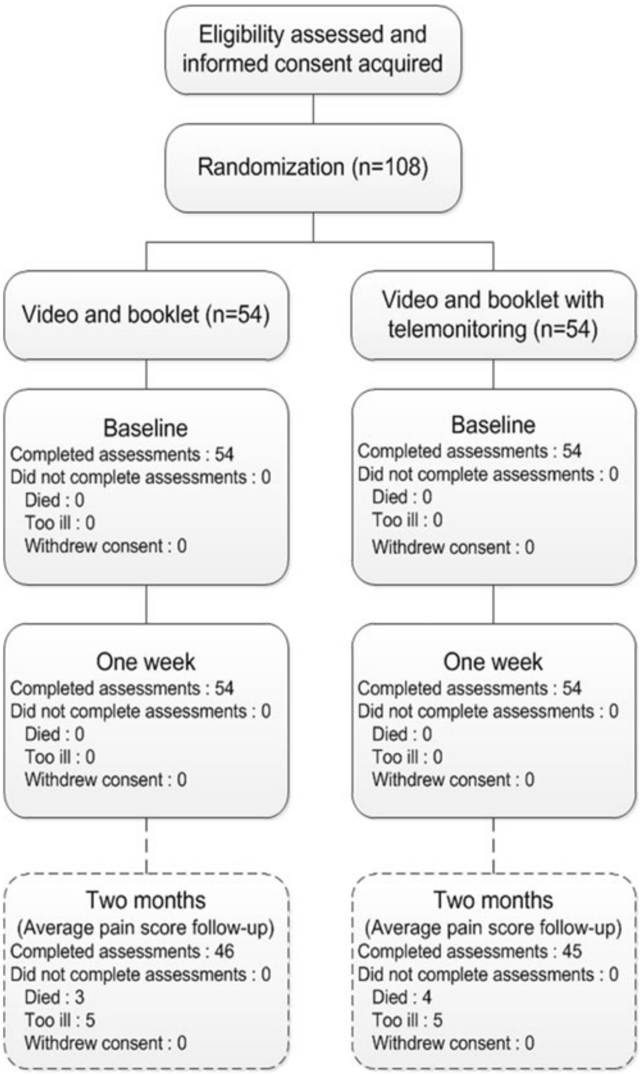

Fig. 1 Study overview

Patients and methods

Overview

This study was a randomized controlled trial. Between October 2010 and July 2011, a total of 108 patients at Severance Hospital were randomly assigned to receive standardized pain education only or standardized pain education plus telemonitoring for 1 week (Fig. 1). All patients were referred from treating oncologists to a pain clinic. Outcomes were evaluated at baseline and 1 week later in outpatient clinic. This study was approved by the Institutional Review Board of Severance Hospital (4-2010-0400).

Patients

Outpatients between 20 and 80 years old who had been diagnosed with a stage IV advanced solid tumor and experienced at least a moderate level of cancer-related pain, defined as an average Visual Analog Scale (VAS) score ≥4 of 10 over the last 24 h, were eligible. All of the patients had a life expectancy of more than 1 month. Both opioid-naïve and opioid-tolerant patients were eligible. We excluded patients who had cognitive, visual, or hearing impairment and patients who received hospice care or consultation for pain management, as these could be confounding factors. All patients signed a written informed consent.

Intervention

At the time of enrollment, patients completed a baseline demographic questionnaire and were randomly stratified to either receive standardized pain education only or standardized pain education plus telemonitoring using coin toss simulation. For blinding, physicians and a nurse practitioner (NP) were not informed of the randomization.

In both the control and experimental arms, standardized pain education included individualized education and advice using a video-aided presentation and a booklet coached by NP on the first visit. Video-aided presentation and a booklet were totally based on the World Health Organization (WHO) pain control guidelines and National Comprehensive Cancer Network (NCCN) guideline. An NP who specialized in pain management coached each patient and caregivers together for approximately 30 min and checked the following components: baseline questionnaire including performance, the role of analgesics and misconception about using opioids, the importance of pain assessment, the WHO pain control guidelines, and management of pain based on the NCCN guideline. The booklet was composed of common pain management misconceptions, including fear of addiction and being a bad patient; pain assessment tools including VAS score; spaces for writing a pain diary; and the algorithm flow sheet for pain control. For individualization to each patient, a NP examined baseline pain medication and the level of knowledge using simple questions. Education was provided based on patients' knowledge. An example of how to adjust the medication was essentially given. After education and question and answer sessions, the proper pain dosage was recommended to each patient. The algorithm to determine pain control options was based on NCCN guideline. If the patient was not tolerable in oral intake, transdermal patch was recommended. After education, no further education session was allowed in a pain clinic after the first visit and routine practice by medical oncologists was provided after the intervention.

In the experimental arm, telemonitoring regarding pain was performed by an NP everyday for 1 week. The NP phoned the patients and asked for their average VAS pain score and worst VAS pain score in the last 24 h, providing patients a chance to assess the severity of pain by themselves. The NP advised patients whether to increase or decrease medication based on the NCCN guidelines for pain management. The NP was trained in pain management and had no specific training for other psychosocial interventions. The NP conducting telemonitoring is not the same person who performed the standardized education at the baseline. Telemonitoring was provided to patients for 1 week from the first visit.

Outcome measures

At baseline and 1 week after the first visit, we collected information on pain, distress, anxiety and depression, QoL, and performance status using a questionnaire in the outpatient clinic. For pain, average pain at 2 months was also collected. Outcome measures were as follows:

1. Pain

Wisconsin Brief Pain Inventory (BPI) is a widely used standardized questionnaire for evaluating multiple aspects of pain. It rates the severity of pain, including worst, least, and average pain in the last 24 h, on a 0–10 scale along with the degree of interference [22]. Higher scores represent greater severity of symptoms.

2. Anxiety and depression

Hospital Anxiety and Depression Scale (HADS) is a well-validated assessment questionnaire for anxiety and depression in patients with medical illness [23]. It is composed of seven depression and seven anxiety questions, respectively. Each item is scored from 0 to 3, so that possible scores range from 0 to 21 for each section. A score of 11 or higher indicates a mood disorder.

3. Distress

Distress Thermometer (DT) is a well-validated tool for evaluating distress from 0 (no distress) to 10 (extreme distress) [24]. The 40-item Problem List was reviewed with patients to identify their problems in five different categories: practical, family, emotional, spiritual/religious, and physical issues.

4. QoL

The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) is a well-defined instrument containing 30 items for cancer patients [25]. It measures global QoL, functioning, and disease-related symptoms. A higher score for QoL represents a higher QoL.

5. Performance

The Karnofsky performance score is a standardized tool for evaluating functional impairment. It runs from 100 to 0, and 100 means normal without complaints and 0 means death. Generally, scores less than 40 represent an inability to care for oneself and a requirement for hospital care. Scores from 40 to 70 indicate patients are able to live at home and care for most personal needs. Patients scoring higher than 70 are able to carry on normal activity and to work. Karnofsky performance rating criteria was provided to each patient and performance score was measured by a patient's self-report.

Statistical analysis

The primary endpoint of the study was a significant reduction of 20 % in the average pain scale (more than 4) in the standardized education plus telemonitoring group (30 %) compared to the standardized education only group (50 %). Baseline demographic data between the standardized education only and the standardized education plus telemonitoring groups were compared using independent Student's *t* tests for continuous data and chi-squared test for categorical data. Changes from baseline to 1 week were assessed within each group using paired *t* tests for continuous data and generalized logit model using generalized estimating equation approach for categorical data. *P* values were two-sided with 0.05 set as the level of significance. All calculations used actual data and adjustments were not made for missing data. Data analysis was performed using SPSS software (version 18.0).

Results

Patient characteristics

One hundred and eight patients with newly diagnosed stage IV advanced solid tumors and with at least a moderate level of cancer-related pain were randomized to either standardized education (*n*=54) or standardized education plus telemonitoring (*n*=54) (Fig. 1). The demographic characteristics of the patients are summarized in Table 1. The overall mean age was 59.8 and there was a higher proportion of men (67.6 %). The most common cancer was gastrointestinal cancer, including stomach and colon (*n*=39, 36.1 %), followed by lung (*n*=23, 21.3 %) and head and neck cancer (*n*=17, 15.7 %). Most patients were prescribed opioid analgesics (95.4 %). There were no significant differences in any of the demographics between the two groups.

Characteristics of the pain, distress, depression, anxiety, QoL, and performance at baseline

Baseline characteristics for outcomes are shown Table 2. Average and worst pain were 4.7 and 7.3, respectively, on a 0–10 scale, which indicates a substantial severity of pain. Three-fourths of the patients had a mood disorder, such as anxiety or depression. More than 90 % of patients had a level of distress that was clinically significant (distress scale≥4). The mean global QoL score was 41±18 on a 0–100 scale, which is poorer than 56.3, which is the reference value for recurrent or metastatic patients [26]. The mean Karnofsky performance score was 32, which indicates a requirement for special care and assistance. There were no significant intergroup differences in any of the outcome parameters at baseline.

Table 1 Baseline characteristics of the 108 subjects

Characteristic	Standardized education group (*n*=54)	Standardized education plus telemonitoring group (*n*=54)	Overall (*n*=108)	*P* value
Age (median, years)	59.5	61.7	59.8	0.73
Male, no. (%)	38 (70.4)	35 (64.8)	73 (67.6)	0.54
Female, no. (%)	16 (29.6)	19 (35.2)	35 (32.4)	
Body mass index (BMI)	22.06	21.93	21.99	0.83
Type of cancer, no. (%)				
Breast	2 (3.7)	4 (7.4)	6 (5.6)	0.48
Gastrointestinal tract	19 (35.2)	20 (37.0)	39 (36.1)	
Genitourinary tract	4 (7.4)	7 (13.0)	11 (10.2)	
Lung	15 (27.7)	8 (14.8)	23 (21.3)	
Head and neck	7 (13.0)	10 (18.5)	17 (15.7)	
Other[a]	7 (13.0)	5 (9.3)	12 (11.1)	
Comorbidity, no. (%)				
Diabetes mellitus	3 (5.6)	7 (13.0)	10 (9.3)	0.76
Hypertension	5 (9.3)	9 (16.7)	14 (13.0)	
Cerebrovascular disease	0	0	0	
Heart[b]	2 (3.7)	2 (3.7)	4 (3.7)	
Lung[c]	2 (3.7)	1 (1.8)	3 (2.8)	
Chronic hepatitis	3 (5.6)	1 (1.8)	4 (3.7)	
Chronic renal failure	0	1 (1.8)	1 (0.9)	
Pain medication, no. (%)				
Opioid analgesics	52 (96.3)	51 (94.4)	103 (95.4)	1.00
Nonopioid analgesics	2 (3.7)	3 (5.6)	5 (4.6)	

[a] Includes pancreas (*n*=4), hepatome (*n*=3), sarcoma (*n*=2), primary peritoneal carcinomatosis (*n*=1), giant cell tumor of the spine (*n*=1), and primary unknown cancer (*n*=1)

[b] Includes patients with heart failure, angina, and arrhythmia

[c] Includes patients with chronic obstructive lung disease and asthma

Table 2 Baseline values for outcome measures (n=108)

Outcome measures		Standardized education group (n=54)	Standardized education plus telemonitoring group (n=54)	Overall (n=108)	*P* value
BPI	Average pain	4.6	4.8	4.7	0.46
	Worst pain	7.1	7.4	7.3	0.72
	Interference	5.6	5.8	5.7	0.56
HADS	Anxiety, *n* (%), ≥11	42 (78 %)	39 (72 %)	81 (75 %)	0.50
	Depression, *n* (%), ≥11	41 (76 %)	38 (70 %)	79 (73 %)	0.52
DT	Distress scale, *n* (%), ≥4	48 (88.9)	51 (94.4)	99 (91.7)	0.30
	No. of problems—mean	21	21	21	0.42
Global quality of life, mean (SD)		41 (18.5)	42 (17.5)	41 (18.0)	0.83
Karnofsky performance, mean		33	31	32	0.24

BPI Brief Pain Inventory, *HADS* Hospital Anxiety and Depression Scale, *DT* Distress Thermometer, *SD* standard deviation

Changes in pain, distress, depression, anxiety, QoL, and performance at 1 week in all patients (n=108)

All pain scales were improved at 1 week, including worst (7.3 to 5.7, P<0.01) and average pain (4.6 to 3.8, P<0.01) (Table 3). There was a significant reduction in the proportion of patients whose pain scale was ≥4 (44 % to 28 %, P=0.01). Interventions not only improved pain but also resolved other clinical outcomes, including anxiety (HADS score≥11, 75 % to 56 %, P<0.01), depression (HADS score≥11, 73 % to 51 %, P<0.01), and Karnofsky performance (32 to 66, P< 0.01). On the EORTC CTC-Q30 questionnaire, functional scales, including emotional, cognitive, and social functions, were improved. Symptomatic scales involving fatigue (68 to 63, P<0.01), pain (90 to 76, P<0.01), and insomnia (83 to 74, P<0.01) were also improved, but constipation was increased (53 to 72, P<0.01). The level of distress scale was not significantly decreased (distress scale≥4, 92 % to 87 %, P=0.27) and the average number of problems did not change (21 of total 40 problems, P=0.49). Improved patient outcomes did not differ according to primary cancer types (data not shown).

Effect of the addition of telemonitoring for 1 week in patients receiving standardized pain education

To test for an additional effect of telemonitoring for 1 week in patients with standardized pain education, telemonitoring was added to the experimental arm (n=54). Outcomes between groups are shown in Table 4. The portion of the patients with an average pain intensity ≥4 was significantly reduced in the standardized education plus telemonitoring groups compared to the standardized education only group (35 % to 19 %, P= 0.02). The average (−1.2 vs. −1.9) and worst (−0.7 vs. −1.2) pain scales decreased more in the telemonitoring group, but this was not statistically significant. Meanwhile, with regards to improving pain management, the addition of telemonitoring

Table 3 Overall course of clinical outcomes between baseline and 1 week

Clinical outcomes (n=108)		Baseline	1 week	*P* value
BPI	Worst pain	7.3	5.7 (−1.6)	<0.01
	Average pain	4.6	3.8 (−0.8)	<0.01
	Interference	5.7	5.2 (−0.5)	<0.01
	No. of pain scale (4–10)	48 (44 %)	30 (28 %)	0.01
HADS	Anxiety, *n* (%), ≥11	81 (75 %)	60 (56 %)	<0.01
	Depression, *n* (%), ≥11	79 (73 %)	55 (51 %)	<0.01
DT	Distress scale ≥4, *n* (%)	99 (92 %)	94 (87 %)	0.27
	No. of problems—mean	21	21	0.49
QoL	Physical functioning, mean (SD)	52 (24)	56 (22)	0.10
	Role functioning, mean (SD)	36 (21)	38 (19)	0.27
	Emotional functioning, mean (SD)	45 (26)	56 (22)	<0.01
	Cognitive functioning, mean (SD)	47 (21)	55 (19)	<0.01
	Social functioning, mean (SD)	27 (17)	33 (17)	<0.01
	Global quality of life, mean (SD)	41 (18)	39 (15)	0.19
Karnofsky performance score—mean (SD)		32 (9.1)	66 (8.6)	<0.01

BPI Brief Pain Inventory, *HADS* Hospital Anxiety and Depression Scale, *DT* Distress Thermometer, *QoL* quality of life, *SD* standard deviation

Table 4 Clinical outcomes of the two groups

Clinical outcomes			Standardized education group (n=54)	Standardized education plus telemonitoring group (n=54)	P value
BPI	Worst pain	Baseline	7.1	7.4	0.11
		1 week	5.9 (−1.2)	5.5 (−1.9)	
	Average pain	Baseline	4.6	4.8	0.24
		1 week	3.9 (−0.7)	3.6 (−1.2)	
	Interference	Baseline	5.6	5.8	0.44
		1 week	5.2 (−0.4)	5.1 (−0.7)	
	No. of pain scale (4–10)	Baseline	22 (41 %)	26 (48 %)	0.02
		1 week	19 (35 %)	10 (19 %)	
HADS	Anxiety	Baseline n (%), ≥11	42 (78 %)	39 (72 %)	0.34
		1 week n (%), ≥11	29 (54 %)	31 (57 %)	
	Depression	Baseline n (%), ≥11	41 (76 %)	38 (70 %)	0.64
		1 week n (%), ≥11	28 (52 %)	27 (50 %)	
DT	Distress scale ≥4	Baseline n (%)	48 (89 %)	51 (94 %)	0.09
		1 week n (%)	49 (91 %)	45 (83 %)	
	No. of problems—mean	Baseline	21	21	0.35
		1 week	21	20	
QoL	Physical functioning	Baseline, mean (SD)	57 (22)	48 (25)	0.03
		1 week, mean (SD)	55 (21)	56 (23)	
	Role functioning	Baseline, mean (SD)	38 (20)	33 (23)	0.27
		1 week, mean (SD)	38 (20)	38 (19)	
	Emotional functioning	Baseline, mean (SD)	45 (25)	44 (27)	0.33
		1 week, mean (SD)	54 (24)	58 (20)	
	Cognitive functioning	Baseline, mean (SD)	49 (20)	45 (23)	0.13
		1 week, mean (SD)	54 (17)	57 (20)	
	Social functioning	Baseline, mean (SD)	27 (17)	28 (17)	0.69
		1 week, mean (SD)	32 (18)	35 (17)	
	Global quality of life	Baseline, mean (SD)	41 (19)	42 (18)	0.60
		1 week, mean (SD)	38 (12)	40 (17)	
Karnofsky performance score		Baseline, mean (SD)	33 (9.4)	31 (8.7)	0.68
		1 week, mean (SD)	65 (9.2)	66 (8.0)	

BPI Brief Pain Inventory, *HADS* Hospital Anxiety and Depression Scale, *DT* Distress Thermometer, *QoL* quality of life, *SD* standard deviation

for pain did not show further improvement of psychiatric and other outcomes involving anxiety, depression, distress, QoL, and performance scores. The average pain scale at 1 week was maintained at 2 months in the standardized education group (3.9 to 4.0) (Fig. 2). In the telemonitoring group, the improved average pain scale at 1 week returned to the level of the standardized education group (3.6 to 4.1).

Discussion

This study evaluated the effect of standardized pain education using a video and a booklet and compared the additional benefit of telemonitoring for pain in outpatients with advanced cancer. Outcomes included measurements not only of pain itself but also anxiety, depression, distress, QoL, and performance because we hypothesized pain improvement influences psychosocial aspects of patients with advanced cancer. After 1 week of education, outcomes including pain, anxiety, depression, QoL, and performance improved. The addition of telemonitoring to standardized pain education helped to improve pain management.

Patients with advanced cancer are frail and have a short life expectancy. Interventions for pain in this group are especially necessary as pain control would be the best of practice increasing QoL in the absence of active treatment options. We investigated this unmet need in terminal cancer patients in the outpatient setting. Above all, simplicity should be considered in this setting. Educational interventions have improved cancer pain in previous studies [14-17], and educational interventions involving both a video and booklet have been shown to be more effective in pain management than either alone [18, 19]. Recently, telecare for pain and depression by Kroenke et al. was shown to improve both outcomes in cancer patients compared to usual care for pain control [21]. In other words, more care and education naturally improve patient outcomes. However, considering practical issues, especially in the outpatient

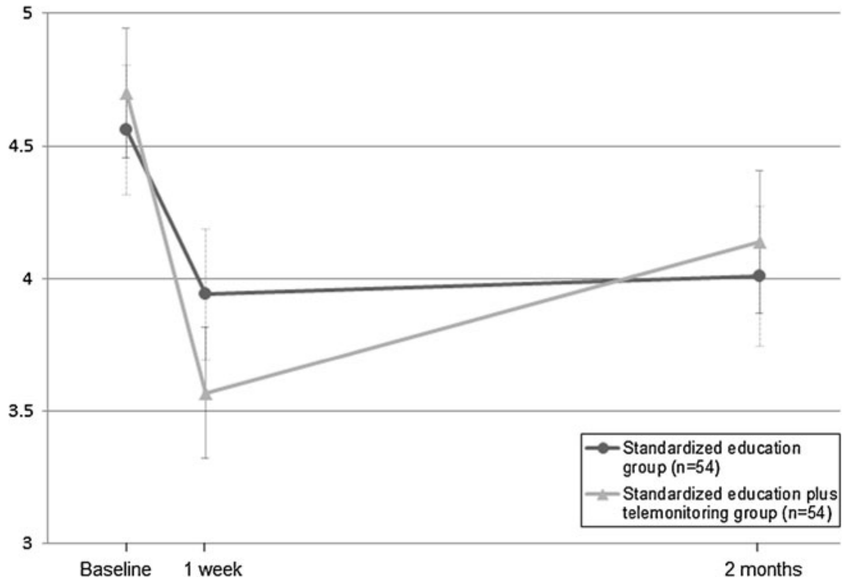

Fig. 2 Average pain scale at baseline, 1 week, and 2 months

setting with advanced cancer patients, we needed to develop simple educational materials that are easily applicable to frail patients. Distinct from the study performed by Kroenke et al. [21], this study was focused on patients with terminal stage and provided the role of telemonitoring in pain management only. We also examined the effect of pain improvement on secondary outcomes (anxiety, depression, distress, QoL, and performance).

Patients with stage IV cancer showed considerable pain severity that impaired function (average pain of 4.7 in Table 2), which was comparable to a previous report [27]. Most patients had accompanying anxiety (75 %), depression (73 %), distress (92 %), and poor QoL and performance necessitating special care by caregivers. Interestingly, intervention for pain improved these physical and psychosocial outcomes in 1 week (Table 3). It is accepted that educational intervention improves knowledge of pain and analgesia and reduces patient barriers to using opioid medication and expressing pain intensity [14]. Several cross-sectional studies have shown that patients with pain have more frequent anxiety and depression and lower levels of performance and QoL than patients without pain [28-30]. However, it is controversial whether pain has a causal relationship with other factors, including anxiety, depression, and QoL. As intervention in this study was confined to pain only, our results may provide evidence that pain improvement induces betterment of physical and psychosocial factors with the exception of distress (Table 3). Distress is defined as a multifactorial unpleasant emotion combining psychological, social, and spiritual factors [24], and it is presumed that pain control alone is not sufficient for general distress improvement. As the impact of pain control on other physical or psychosocial factors might depend on the disease setting, the type of intervention, and the type of questionnaire, further studies are needed for each specific condition.

An effective schedule of educational intervention to improve cancer pain may depend on demographic (e.g., age), clinical (e.g., cancer type and stage), psychosocial (e.g., depression), and interindividual variability [31]. Our study showed improvement in a relatively short period of 1 week. Several explanations are possible. First, the patients' pain intensity was relatively high and generally, pain affects patients more significantly as it becomes more severe [27]. Second, the intervention could have a great impact on palliative patients for whom active treatment is not possible. The intervention might make patients perceive that they are receiving care and have a positive effect on outcomes. Third, allowing caregivers to receive standardized education may help improve outcomes. Because patients usually need a caregiver's assistance, most of the intervention was performed with patients and their caregiver. Though one 30-min session succeeded in improving outcomes, the effect of education diminished after 2 months (Fig. 2), and this implies multiple exposures might be necessary for palliative patients. Multiple exposures could be substituted for periodic telemonitoring. A subsequent trial is needed to identify the optimal schedule and period of telemonitoring in patients with advanced cancer.

The additional effect of telemonitoring was helpful for improving primary pain management but not secondary outcomes, such as distress, depression, anxiety, or QoL. Given that the standardized pain educational program alone improved pain and secondary outcomes, the additional yield of telemonitoring seemed to be small. However, daily telemonitoring for about 10 min is a simple way to monitor patients that does not require frequent visits to the clinic. Telemonitoring for pain and other psychosocial factors like depression also potentiate patient care [21].

There were two limitations in this study. First, the addition of telemonitoring improved the portion of average pain ≥4 but did not show significant improvement of other pain outcomes such as worst pain, average pain, and interference. One potential reason is 1 week might be short enough to show obvious differences. Opioid titration demands time to be fully adjusted. As optimal average pain score is less than 3 (mild pain), average pain of 3.6 in telemonitoring group after 1 week could be decreased to <3 if the telemonitoring is continued. Another reason could be owing to advanced disease setting. As pain in stage IV cancers is often severe, a short-term effect would be minimal between two groups. Long-term follow-up strategy should be addressed. Second, the initial Karnofsky score (<40, requires special care and assistance) could be lower than the actual value. In spite of initial low performance score, patients could undergo baseline screening with multiple variable assessments. This discrepancy is likely due to self-reported Karnofsky score. When patients were referred to a pain clinic for the first time, they suffered from uncontrolled pain. Unrelieved pain might affect their performance negatively.

In conclusion, standardized pain education using a nursing specialist is an efficient way to improve not only pain itself but also anxiety, depression, performance, and QoL in 1 week. The addition of telemonitoring helps to improve pain management, and telemonitoring is a simple intervention for outpatients with advanced tumors.

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Conflict of interest None.

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