

Short Communication

Problem-Solving Therapy for Psychological Distress in Japanese Cancer Patients: Preliminary Clinical Experience from Psychiatric Consultations

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Problem-solving therapy (PST) is a brief, structured psychological treatment. Preliminary clinical findings regarding the effectiveness of PST for treating psychological distress experienced by Japanese cancer patients are presented. Our actual clinical experience in administering PST to four consecutive distressed cancer patients was reviewed. All of the patients were breast cancer survivors who were referred to us after undergoing surgery. Three cases received six PST sessions each and one case received three PST sessions. The depression and anxiety scores decreased after PST. Our preliminary experience suggests that PST is an effective treatment for alleviating psychological distress in Japanese cancer patients and that this treatment should be further examined in a clinical trial.

Key words: cancer – psychological distress – problem-solving therapy – psychological intervention

INTRODUCTION

The experience of cancer causes considerable stress in patients. Depression and anxiety, including adjustment disorders and major depression, are the most prevalent forms of psychological distress experienced by cancer patients (1). Patients sometimes seek psychological treatment to help them cope with their cancer even though their psychological status does not meet the criteria of a formal psychiatric diagnosis (1). Previous Japanese studies investigating the prevalence of psychological distress in cancer patients have reported rates of 15–40% (2,3). Psychological distress not only causes great suffering, but also diminishes quality of life, amplifies pain and other symptoms, and sometimes leads to suicide.

Regarding therapy for psychological distress, two potentially effective management strategies are available: psychotherapy and pharmacotherapy. A previous Japanese study indicated that psychotherapy is deemed more acceptable than pharmacotherapy by cancer patients (4). Although previous reviews have highlighted the general efficacy of various psychosocial interventions, very few studies have addressed which kinds of psychotherapy are feasible or effective for Japanese cancer patients in actual clinical oncology practice. In this context, we have been interested in the effectiveness of problem-solving therapy (PST), which is a brief, structured psychological treatment (5). PST has been shown to be effective for the treatment of common mental disorders, including depression and anxiety, in primary care and oncology settings in Western countries (5).

The current report introduces our preliminary clinical findings regarding the effectiveness of PST for treating psychological distress experienced by Japanese cancer patients.

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PATIENTS AND METHODS

SUBJECTS

The subjects were four consecutive cancer patients who were referred to one of the authors for PST. The patients were referred for the treatment of psychological distress and were followed up by one of the authors. The patients received PST for several reasons, such as intolerability and/or reluctance to use medications and refractoriness to general supportive psychotherapeutic approaches. Psychiatric diagnoses were made using the *Diagnostic and Statistical Manual of Mental Disorders*, 4th Edition (DSM-IV). As this study was conducted in the routine clinical setting, treatments of PST were provided under usual health national insurance system (we therefore could not charge the patients any special fee for PST). In the following, several items of personal information were modified to preserve the anonymity of the patients.

PROBLEM-SOLVING THERAPY

PST focuses on the present and helps patients to use their own skills and resources to function better. The patients are taught how their psychological symptoms may be linked to psychosocial problems that they are facing, and PST provides the patients with a structured strategy to solve them. If these problems can be resolved, their symptoms may improve. PST includes the following seven steps (5): (i) explanation of the treatment and its rationale, (ii) identification, definition and breakdown of the problem, (iii) establishing achievable goals, (iv) generating solutions, (v) evaluating and choosing the solution, (vi) implementing the chosen solution, (vii) evaluating the outcome after the solution has been implemented. We developed a PST manual for Japanese cancer patients. The manual was designed to help the patients list and summarize problems commonly encountered by cancer patients, including cancer treatment, symptoms of cancer, treatment side effects, fear of recurrence/metastasis, relationship with medical staff, family and other people, economic problems, information issues, employment/school issues. The manual also includes tips and worksheets for patients to use while progressing through each step of PST. The first treatment session lasted about 90 min, and subsequent sessions lasted 40–50 min. In principle, six treatment sessions were given. In addition, we incorporated a simple behavioral treatment skill, activity scheduling, into the PST (5). In activity scheduling, we helped the patients find and then engage in pleasurable activities on a more frequent basis to help alleviate their psychological distress.

ASSESSMENT

We used two psychological measures, the Beck Depression Inventory-II (BDI-II) (6) and the Hospital Anxiety and Depression Scale (HADS) (7), to evaluate psychological distress in clinical practice, depending on the patients' psychological status. The BDI-II is a 21-item self-reported questionnaire

to evaluate the severity of depression. The total score can range from 0 to 63, with higher scores representing severer depression. The validity and reliability of the Japanese version of the BDI-II has been confirmed (8). Depression severity was assessed according to the following BDI scores (9): 0–13, minimal; 14–19, mild; 20–28, moderate; 29–63, severe. The HADS is a 14-item self-reported questionnaire consisting of an anxiety and depression subscale; the total score can range from 0 to 42. Higher scores indicate severer anxiety and depression. The Japanese version of the HADS has been validated for cancer populations, and the optimal cut-off point for screening for adjustment disorder and major depressive disorder was 10 of 11 (10). In this report, the results of these measures before and immediately after intervention were used.

Because of the small sample size, we presented the descriptive statistics of the BDI-II and HADS scores pre- and post-intervention only.

RESULTS

All of the patients were breast cancer survivors who were referred to us after undergoing surgery (Table 1). Their psychiatric diagnoses varied, ranging from normal reaction to major depression. Both the BDI-II scores [pre: 26.8 (SD = 14.0); post: 13.3 (SD = 7.7)] and the HADS scores [pre: 17.0 (SD = 2.6); post: 9.7 (SD = 3.5)] improved after PST. Three patients completed all six PST sessions, while one patient received only three PST sessions (one case, a 32-year woman, terminated PST early because she declined further treatment after finding a new job.). Patient adherences with each therapy session, including activity scheduling, was generally excellent for all the four patients.

Here, the clinical process of PST is introduced using one example case (Ms. D). Ms. D was a 52-year-old housewife who lived with her husband and two children. She was diagnosed as having early-stage breast cancer (Stage 0) and received a surgical resection (simple mastectomy). Because the results of a sentinel lymph node biopsy were negative, she was told that she would not need any further adjuvant therapy. However, she became nervous and anxious about the possible recurrence of her breast cancer and its development into a serious physical disease. Consequently, she could not sleep and began to feel several kinds of physical discomfort, including dizziness, tinnitus and palpitations. She visited an otolaryngologist and neurologist, but no evidence of organic disease was found. Three months after her operation, she consulted a psychiatric clinic and began to take psychotropic medications, including antidepressants and benzodiazepines, and was subsequently referred to one of the authors. An initial assessment revealed a depressive mood and a fear of recurrence, and she was diagnosed as having an adjustment disorder with mixed emotional features (BDI-II score, 31). Thereafter, we continued to provide her with general psychosocial treatment, including continuous medication and supportive psychotherapy. However, her condition remained unchanged during the

Table 1. Characteristics of the cancer patients

Age	Sex	Cancer site	Stage	Cancer treatment (period after cancer diagnosis at the start of PST)	Psychiatric diagnosis	PST	BDI-II score		HADS score	
							Pre PST	Post PST	Pre PST	Post PST
32	Female	Breast	Early	Hormone therapy after left mastectomy (18 months after diagnosis)	Major depression in partial remission	3 sessions during 4 weeks	21	17	19	13
47	Female	Breast	Early	Hormone therapy after left partial mastectomy + radiation (20 months after diagnosis)	Normal reaction, but having perceived distress	6 sessions during 10 weeks	12	2	14	6
47	Female	Breast	Locally advanced	None after right mastectomy + chemotherapy (53 months after diagnosis)	Major depression	6 sessions during 20 weeks	45	15	NA	8
52	Female	Breast	Early	None after left simple mastectomy (13 months after diagnosis)	Adjustment disorder with mixed emotional features	6 sessions during 12 weeks	29	21	18	10

BDI-II, Beck Depression Inventory-II; HADS, Hospital Anxiety and Depression Scale; PST, problem-solving therapy; NA, not applicable. One case, a 32-year-old woman, completed only three PST sessions.

next 8 months. We therefore introduced her to the concept of PST and she expressed an interest. At this time, her BDI-II score was 29. During the PST session, various problems were revealed, including a fear of recurrence, dissatisfaction with her communication with her physician, marital discord and tension with her husband, and frequent difficulties with her son. Interestingly, she selected the difficulties with her son as the first problem that she would like to deal with using PST. During the PST session, she stated that much of her distress resulted from quarrels with her son, and these quarrels often began after she had scolded him. Using the PST skills, she defined her problem ('I can't help scolding my son.') and defined an achievable goal ('I will refrain from scolding him for a couple of hours after his return from school.'). She generated nine potential solutions and finally selected three solution strategies. She was able to complete most of the solution strategies. During the evaluation process, she said, 'I feel better because I am having fewer quarrels with my son.' After the third PST session, she stated, 'Lately, I am not so worried about my disease' and 'I feel that I shall see what I shall see'. At this time, her BDI-II score was 19. She next tried to resolve her marital discord. Although this problem was not successfully solved, she understood that her goal was too difficult and that she needed to set a smaller goal. She completed a total of six PST sessions over a period of 3 months. By the completion of the PST, her feelings had improved (Table 1). Although the six sessions were not sufficient to deal with all of her problems and she partly failed to resolve one of her problems, as mentioned, she felt that 'I will be able to cope with my problems using the PST'.

DISCUSSION

Many types of psychosocial interventions exist for reducing psychological distress among cancer patients. However, very

few studies have confirmed the effectiveness of such interventions in Japan, and the available studies were limited to group psychosocial interventions (11,12) and progressive muscle relaxation (PMR) (13). Several barriers to providing such interventions exist in the Japanese medical system and/or culture, including the difficulty of accruing a homogeneous cancer patient group for appropriate interventions, disadvantages of group interventions for some patients (e.g. reluctance to share individual experiences), and the patient's dissatisfaction with simple behavioral interventions such as PMR. Furthermore, although Western studies have systematically reviewed the effectiveness of psychosocial interventions for cancer patients, demonstrating that cognitive behavioral therapy is recommended (14), our clinical experience suggests that most cancer patients do not have extreme distortions of cognition and that traditional cognitive therapeutic interventions are often not appropriate for cancer patients. Additionally, fewer trained clinical psychologists are available to provide formal psychological intervention for cancer patients in Japan, and this situation creates a barrier to its dissemination among them. In this context, we are interested in using PST to alleviate psychological distress in cancer patients within the Japanese medical system, based on the appropriateness and simplicity of PST.

The current findings suggest that PST can be used to alleviate common forms of psychological distress experienced by cancer patients, such as adjustment disorders and/or major depression. In addition, good adherence to the therapy suggests PST is an acceptable therapy for Japanese cancer patients. Furthermore because PST is a brief therapy that consists of six treatment sessions, PST can be a cost effective psychotherapy. The fact that the subjects were cancer survivors, including both short and long duration after cancer diagnosis, who continued to experience psychological distress after cancer diagnosis, suggests that one of possible subjects who benefit from PST may be distressing cancer

survivors, irrespective of duration after cancer. Although many cancer survivors experience a fear of recurrence and a previous Japanese survey indicated that the most common distress experienced by Japanese cancer patients is a fear of recurrence and/or disease metastasis (15), no standard interventions for alleviating this form of distress exist (16). Our experience suggests that PST may be useful for reducing fears of recurrence, although PST does not directly deal with fear or anxiety itself but instead focuses on present daily problems. In addition, a previous study suggested the usefulness of PST for alleviating distress among palliative care patients (17). These findings suggest that PST can be used for a broad range of psychological distress in clinical oncology settings. On the other hand, because we could not find the long-lasting effect of PST (e.g. 6 or 12 months after treatment), whether the effect of PST is persistent or not should be addressed in a future study. In addition, because treatment period ranged widely from 4 to 20 weeks in the current study, we could not determine the best treatment period for cancer patients' illness trajectory. We also need to address this issue in a future study.

The present findings are very limited because our case series is seriously flawed by many methodological weaknesses, especially many types of bias resulting from systematic and random errors. However, our experience indicates that the PST is a promising psychosocial intervention that should be investigated in further well-designed clinical trials in Japanese clinical oncology settings. We are now planning a clinical trial to investigate the effectiveness of PST on fear of recurrence among breast cancer survivors.

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Conflict of interest statement

None declared.

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Self-efficacy, psychological adjustment and decisional-balance regarding decision making for outpatient chemotherapy in Japanese advanced lung cancer

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This study examined the application of the trans-theoretical model (TTM) for readiness for decision-making of outpatient chemotherapy of Japanese advanced lung cancer patients by a cross sectional questionnaire survey. A questionnaire was conducted with 105 Japanese patients diagnosed with advanced lung cancer receiving chemotherapy. We classified them according to the TTM stages, including 4 in precontemplation, 42 in contemplation, 22 in preparation, and 35 in action. The valid model ($\chi^2(37) = 42.56, p = 0.24$; GFI = 0.93; AGFI = 0.88; CFI = 0.98; RMSEA = 0.04; AIC = 100.56) derived from structural equation modeling (SEM) revealed that stage of outpatient chemotherapy was significantly affected mostly by decisional-balance ($\beta = 0.60, p < 0.001$) and partially by time from the patient's house to the hospital ($\beta = -0.15, p < 0.10$), and that decisional-balance was significantly affected by self-efficacy ($\beta = 0.48, p < 0.001$) and nausea ($\beta = -0.23, p < 0.01$). The findings from our study provided encouraging results for adopting the TTM in decision making for outpatient chemotherapy in Japanese cancer care and several clinical implications were obtained from the results.

Keywords: trans-theoretical model; decisional-balance; self-efficacy; outpatient chemotherapy; lung cancer

Introduction

Advanced lung cancer carries a poor prognosis and requires treatment with chemotherapy. Recently, improvements in the quality-of-life (QOL) of advanced lung cancer patients has become essential for good cancer treatment and care (Bottomley, Efficace, Thomas, Vanvoorden, & Ahmedzai, 2003; Ishihara et al., 1999). Supportive care in cancer treatment at home, especially is important for their QOL (Sakai, 2002; Tsukagoshi, 2002). In western countries, outpatient lung cancer treatments are common, but in Japan most patients receive treatment in hospital (Sakai, 2002). One of the reasons for this difference

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may be the requirement of Japanese national insurance system that chemotherapy is administered in an inpatient setting. Recently, the Ministry of Health decided to allow insurance payments for outpatient chemotherapy for cancer patients (Sakai, 2002). In Addition, Japanese oncologists have recognized the importance of outpatient chemotherapy for lung cancer to improve the patients' QOL and have started to recommend such outpatient services for their patients (Asai, Minami, Komuta, & Kido, 2000; Chohnabayashi, Uchiyama, Nishimura, & Nasu, 2004; Kawasaki et al., 2003) and several cancer centers have started outpatient clinic centers for cancer patients (Kobayashi & Kobayashi, 2000).

However, patients are still reluctant to make a decision to go home and receive inpatient treatment instead. One reason for reluctance of the patients may be the strong psychological influence on their decision making process. To develop support systems for the patients, clarification of this psychological mechanism is needed. Thus, we tried to apply a framework and a theory from psychology to clarify the patients' decision making process in the transition from inpatient treatment to outpatient treatment.

In health psychology and behavioral medicine, several theories and models have been developed to account for health behavior. Among these, the trans-theoretical model (TTM) (Prochaska & DiClemente, 1983) is useful to explain changes and has been adopted in not only health problem settings such as several studies of smoking cessation (Prochaska & DiClemente, 1984), but also various health behaviors. For example, in the area of cancer medicine, TTM has been applied to examine compliance in health screening for colorectal cancer generic testing (Manne et al., 2002), and mammography adoption (Lauver, Henriques, Settersten, & Bumann, 2003; Rakowski, Fulton, & Feldman, 1993). We believe that application of the TTM to examine patients' behavior and the intention to receive chemotherapy after transitioning from inpatient to outpatient status will be very useful to clarify the psychological factors underlying the patient decision making process for outpatient chemotherapy.

In addition, in the TTM, the function of self-efficacy has an important role in the stage of change, and mediates between the intention for behavioral change and actual behavior (Prochaska & DiClemente, 1984). Several studies have pointed out that self-efficacy has a great impact on psychological adjustment, including the anxiety and depression of advanced cancer patients (Beckham, Burker, Lytle, Feldman, & Costakis, 1997; Hirai et al., 2002; Lin, 1998; Merluzzi, Nairn, Hegde, Martinez Sanchez, & Dunn, 2001). It is hypothesized that self-efficacy and psychological adjustment may correspond to the readiness or stage of change for outpatient chemotherapy. Thus, self-efficacy may indicate the possibility to develop psychologically-oriented interventions for patients who would benefit from outpatient chemotherapy.

Thus, this study attempted to examine the readiness for outpatient chemotherapy of advanced lung cancer patients in Japan using TTM. In particular, the attempt was focused on the function of self-efficacy and psychological adjustment in terms of the readiness for the treatment. Finally, we discussed the clinical implications derived from our results.

Methods

Participants

The participants were consecutively recruited from one specialized hospital for chest disease using convenient sampling from March 2003 to July 2003. The sample was

composed of 105 Japanese patients diagnosed with advanced metastatic lung cancer, who were inpatients and outpatients receiving chemotherapy. All patients without dementia or delirium were informed of the aim and methods of this study, and their written consent was obtained.

Measures

We developed a questionnaire with a face sheet and four psychological measurements. The face sheet included questions regarding each participant's background, including age, gender, and knowledge and past experience of outpatient chemotherapy.

In a previous preliminary interview study (Hirai, Tokoro, Naka, Ogawara, & Kawahara, 2005) and preliminary analysis (Arai, Hirai, Tokoro, & Naka, 2006), we developed two psychological scales based on TTM: A single item to measure the stage of readiness and a decisional-balance scale for outpatient chemotherapy in lung cancer patients. A single item to evaluate patients' stage of readiness included four alternatives for stage of readiness: *Precontemplation* ("I have no interest in receiving outpatient chemotherapy."), *contemplation* ("I have been thinking that I might want to receive outpatient chemotherapy."), *preparation* ("I am preparing to receive outpatient chemotherapy."), and *action* ("I have already received outpatient chemotherapy."). This item was proved to have content validity through the content analysis of interview data (Hirai et al., 2005). The decisional-balance scale of outpatient chemotherapy is a 20-item scale with two subscales: Pros and cons. The pros consisted of 10 items: *Freedom of movement; comfortable environment; increased relaxation; increased social support; freedom of time; psychological stability; regarding oneself as an ordinary person; fewer time restrictions; decreased concerns; treated as an ordinary person*. The cons also consisted of 10 items: *Worries about instability of illness; dissatisfaction with consultation time; worries about insufficient treatment; lack of enough nursing; worries about side effects; insufficient facilities for treatment; worries about urgent treatment; lack of information from peers; less communication with medical staff; less medical information*. Each subscale of the decisional-balance scale has been shown to have high reliability (Cronbach alpha = 0.88 for pros and 0.87 for cons) and high structural validity by confirmatory factor analysis ($\chi^2(166) = 223.73$ ($p < 0.001$), GFI = 0.83, CFI = 0.93, RMSEA = 0.06) for the two-factor structure which was hypothesized from the results of our interview study (Arai et al., 2006).

The scale of the Self-Efficacy for Advanced Cancer (SEAC) was designed to assess self-efficacy in terms of the illness behavior of advanced cancer patients (Hirai et al., 2001). It is an 18-item scale with the following three subscales: *Symptom coping efficacy* (SCE; e.g., "I can manage insomnia caused by pain"); *ADL efficacy* (ADE; e.g., "I can enjoy TV or radio programs"); *Affect regulation efficacy* (ARE; e.g., "I can maintain a positive attitude"). The scale is formatted on an 11-point Likert-type scale, ranging from 0 (not at all confident) through 50 (50% confident)–100 (totally confident). Each subscale of SEAC has been shown to have high reliability (Cronbach alpha = 0.73–0.81) and high structural validity (GFI = 0.93–0.96; Hirai et al., 2001). The scale also succeeded in clarifying the significant relationships among physical condition, self-efficacy and psychological adjustment of advanced cancer patients (Hirai et al., 2002).

To assess psychological adjustment, we used the Japanese version (Kitamura, 1993) of the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). The final

part of the questionnaire included six items for subjective physical symptoms (appetite, sleep state, fatigue, dyspnea, feeling of numbness, and pain) and a tangible social support scale (Blake & McKay, 1986).

Finally, the physician-in-charge of the participants evaluated their performance status using the criteria of the Eastern Cooperative Oncology Group performance status (ECOG PS). ECOG PS is widely used to measure the level of patient activity using eleven grades (0-4). Also, the physician reported details of each participant's diagnosis, metastasis, chemotherapy regimen, expected prognosis, and other physical symptoms.

Analyses

The descriptive analyses were conducted to summarize the participants' backgrounds and psychological measurement scores. Those with over 30% missing values on the questionnaire were excluded from the statistical analyses. If one or two scores within the subscales of psychological measurements were missing, the averaged scores of the series were substituted into a formula for the total scores of each subscale. Univariate analysis (ANOVA) preliminarily analyzed the factors predicting stage of readiness, and categorical regression analysis was performed using all significant predictor variables ($p < 0.05$). Because categorical regression analysis proved only one significant and very strong predictor for stage of readiness, that is, a decisional-balance score, we performed correlation analysis using the decisional-balance score. SEM was performed to confirm the multiple relationships among the significant variables in the results of categorical regression and correlation analysis. As the categorical regression analysis confirmed a strong linear relationship between stage and decisional-balance, we transformed each participant's ordinal response for stage into numeric scale. To obtain a valid model to account for stage, we compare the Akaike Information Criteria (AIC) index of each model. This measure indicates a better fit when it is smaller. We adopted a model with a parsimonious structure and a smaller AIC index. We conducted all statistical analyses using the SPSS software package (version. 11.0) and AMOS software package (version. 5.0.1).

Results

Characteristics of the participants

The participants consisted of 78 males and 27 females. Table 1 shows their demographic and diagnostic data including mean age, gender, diagnosis, stage at diagnosis, ECOG PS, distribution of TTM stage for outpatient chemotherapy and mean time from patients' houses to their hospitals. In the distribution of TTM stage, there were four participants in precontemplation, 42 in contemplation, 22 in preparation, and 35 in action. Because of insufficient number ($N=4$) of the participants in precontemplation for multivariate analysis, we excluded their data from the following analyses.

Psychosocial factors associated with the outpatient chemotherapy stage

To explore the differences among patients in the three stages of contemplation, preparation, or action, we reported the mean score of the following independent variables: TTM components, self-efficacy, HADS, physical symptoms and social support (Table 2). Participants in the action stage showed a significantly higher score on pros,

Table 1. Demographic characteristics of the participants.

Mean age \pm SD	64.52 \pm 9.40
Gender	
Male/Female	78/27
Diagnosis	105
Lung cancer	55
Ad	23
Sq	1
La	18
Sm	8
Stage at diagnosis	
Stage IA	2
Stage IB	1
Stage IIA	5
Stage IIB	13
Stage IIIA	14
Stage IIIB	66
Stage IV	4
Missing	1
Inpatient/Outpatient	37/68
PS (ECOG)	
0	29
1	69
2	6
Missing	1
TTM Stage for outpatient chemotherapy	
PC	4
C	42
PR	22
A	35
Missing	2
Mean time (minutes) from house to hospital \pm SD	46.19 \pm 32.29 [10-240]

PC: precontemplation, C: contemplation, PR: preparation, A: action.

decisional-balance and the three variables of self-efficacy than participants in contemplation. Participants in contemplation had a significantly higher score on cons and dyspnea than participants in action. For HADS-depression, participants in preparation had the highest score among the three groups.

For TTM components, there were significantly negative correlations between pros and cons ($r = -0.37$, $p < 0.001$), and between cons and decisional-balance ($r = -0.83$, $p < 0.001$), and a significantly positive correlation between pros and decisional-balance ($r = 0.82$, $p < 0.001$). In addition, correlations between decisional-balance and both pros and cons were comparatively high ($r = -0.83$, $p < 0.001$; $r = 0.82$, $p < 0.001$, respectively). Therefore, we concluded that using these three variables for the multivariate analyses would not be useful and that only using decisional-balance as a representation of TTM components would be valid.

Categorical regression analysis was preliminary performed on the variables showing a significant relationship with stage differences in ANOVA, and revealed that decisional-balance was the main factor to explain the differences in outpatient chemotherapy stage

Table 2. Descriptive data and ANOVA: Mean comparison of outpatient chemotherapy stages.

Measure	Contemplation		Preparation		Action		Total		F(2, 96)	P
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
TTM components										
Pros	33.67	8.18	37.71	6.00	40.55	6.08	37.00	7.61	9.28	0.000
Cons	39.46	5.95	35.55	4.85	28.06	6.81	34.56	7.84	34.19	0.000
Decisional-balance	-5.79	10.77	2.16	8.59	12.49	9.87	2.44	12.78	31.87	0.000
Self-efficacy										
ARE	59.39	16.05	64.62	22.69	70.33	16.63	64.42	18.37	3.57	0.032
SCE	49.68	24.73	52.50	22.07	62.94	21.33	54.99	23.54	3.34	0.040
ADE	64.22	17.64	68.94	15.32	79.60	17.45	70.71	18.25	7.88	0.001
HADS										
Anxiety	5.81	4.03	6.10	2.68	5.21	2.95	5.66	3.39	0.52	0.594
Depression	6.12	2.72	7.00	2.86	5.16	2.46	5.98	2.73	3.32	0.040
Total	11.93	5.74	13.10	5.01	10.38	4.54	11.64	5.24	1.98	0.144
Physical symptom										
Pain	27.56	23.11	28.18	25.57	24.00	23.91	26.43	23.78	0.29	0.753
Appetite	1.95	0.74	1.91	0.81	1.60	0.69	1.82	0.75	2.35	0.101
Insomnia	1.83	0.66	2.00	0.53	1.66	0.54	1.81	0.60	2.33	0.103
Nausea	1.45	0.71	1.48	0.81	1.18	0.46	1.36	0.66	2.07	0.132
Fatigue	1.95	0.70	1.86	0.89	1.80	0.68	1.88	0.73	0.41	.662
Dyspnea	1.45	0.63	1.23	0.43	1.17	0.38	1.30	0.52	3.18	0.046
Numbness	1.71	0.77	1.45	0.60	1.86	0.81	1.71	0.76	1.94	0.150
Social support										
Tangible assistance	3.81	2.38	4.50	2.79	4.79	3.32	4.31	2.83	1.21	0.304
Performance status										
ECOG PS	0.79	0.61	0.77	0.43	0.79	0.59	0.79	0.56	0.10	0.991

ARE: affect regulation efficacy; SCE: symptom coping efficacy; ADE: ADL efficacy.

($\beta = 0.58$, $p < 0.001$; $R^2 = 0.45$). There were no significant effects of other demographic, physical or psychological variables: Affect regulation efficacy ($\beta = -0.03$, *n.s.*), symptom coping efficacy ($\beta = -0.01$, *n.s.*), ADL efficacy ($\beta = 0.12$, *n.s.*), HADS-depression ($\beta = 0.00$, *n.s.*), and dyspnea ($\beta = -0.11$, *n.s.*). These findings suggested presence of a model in which decisional-balance mediated between psychological and physical variables and outpatient chemotherapy stage. Therefore, in the next step of the analyses, we tried to identify the variables that accounted for the variance in the decisional-balance score. Prior to the analysis, preliminary correlation analysis was conducted between decisional-balance and demographic variables (time from house to hospital, stage at diagnosis, expected prognosis, and performance status), physical symptom variables (pain, appetite, insomnia, nausea, fatigue, dyspnea, and numbness), and psychological variables (depression, anxiety and self-efficacy subscales) The results of correlation analysis was represented in Table 3. The analysis showed significant correlations, including time from house to hospital ($r = -0.29$, $p < 0.01$), appetite ($r = -0.25$, $p < 0.05$), nausea ($r = -0.32$, $p < 0.01$), dyspnea ($r = -0.21$, $p < 0.05$), HADS-anxiety ($r = -0.23$, $p < 0.05$), HADS-depression ($r = -0.23$, $p < 0.01$), affect regulation efficacy ($r = 0.39$, $p < 0.001$), symptom coping efficacy ($r = 0.35$, $p < 0.001$), and ADL efficacy ($r = 0.52$, $p < 0.001$). Using SEM, we developed a structural model, which regressed the decisional-balance using these nine

Table 3. Intercorrelations among decisional-balance, demographic variables, physical symptom variables, and psychological variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Decisional-balance	-																
2. Time from house to hospital	-0.29**	-															
3. Stage at diagnosis	0.01	-0.02	-														
4. Expected prognosis	-0.13	0.07	-0.12	-													
5. Performance status	-0.10	0.20	0.13	-0.30**	-												
6. Pain	-0.14	0.17	0.02	-0.22*	0.25*	-											
7. Appetite	-0.25*	0.13	-0.03	-0.02	0.15	0.31**	-										
8. Insomnia	-0.10	-0.06	-0.03	0.00	0.09	0.25*	0.15	-									
9. Nausea	-0.32**	0.19	-0.09	0.05	-0.02	0.35**	0.31**	0.02	-								
10. Fatigue	-0.15	0.27*	0.03	-0.14	0.12	0.46***	0.47***	0.11	0.40**	-							
11. Dyspnea	-0.21*	0.09	-0.17	0.02	0.15	0.05	0.17	0.22*	0.23*	0.12	-						
12. Numbness	0.10	0.11	0.01	-0.08	0.01	0.17	-0.17	-0.12	0.10	0.08	-0.24*	-					
13. Tangible social support	0.09	-0.14	0.00	-0.04	-0.09	-0.14	-0.01	-0.06	0.02	-0.05	-0.06	-0.02	-				
14. HADS-anxiety	-0.23*	0.12	-0.02	-0.09	0.14	0.40***	0.19	0.21*	0.31**	0.46***	0.32**	0.09	-0.16	-			
15. HADS-depression	-0.23*	0.10	-0.04	-0.10	0.10	0.20*	0.22*	0.08	0.18	0.33**	0.01	0.12	-0.11	0.46***	-		
16. Self-efficacy-ARE	0.39***	-0.15	-0.04	-0.02	-0.05	-0.30**	-0.19	-0.33**	-0.25*	-0.28**	-0.17	0.09	0.23*	-0.42***	-0.42***	-	
17. Self-efficacy-SCE	0.35***	-0.12	-0.06	-0.03	-0.14	-0.18	-0.24*	-0.16	-0.18	-0.16	-0.22*	0.05	0.18	-0.22*	-0.22*	0.53***	-
18. Self-efficacy-ADE	0.52***	-0.24*	0.00	-0.12	-0.10	-0.35***	-0.43***	-0.25*	-0.17	-0.40***	-0.17	0.10	0.29*	-0.47***	-0.43***	0.72***	0.59***

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. ADE: ADL efficacy; SCE: symptom coping efficacy; ARE: affect regulation efficacy.

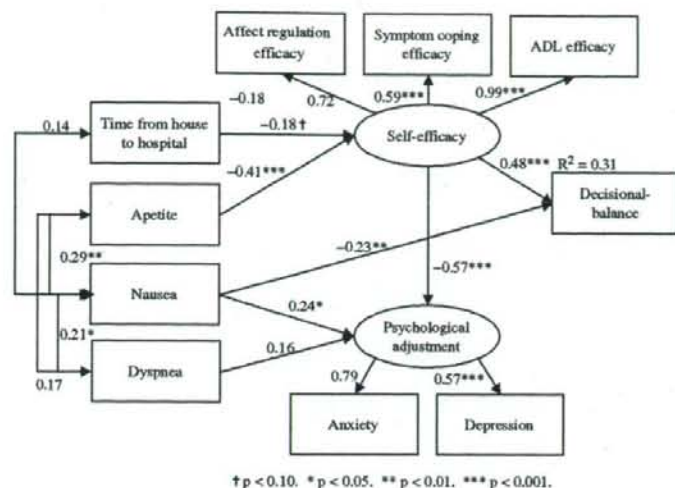


Figure 1. Structural model for decisional-balance of outpatient chemotherapy.

variables set as predictor variables. First, we assumed two latent variables; one was *psychological adjustment*, which explained anxiety and depression of HADS, and the other was self-efficacy, which explained affect regulation efficacy, symptom coping efficacy, and ADL efficacy, because there were significant correlation among these variables. We set environmental and physical symptom variables; time from house to hospital, appetite, nausea, and dyspnea as independent variables in the model, and the latent variables; psychological adjustment and self-efficacy as mediating variables between environmental and physical variables and decisional-balance. Also, we draw a path from self-efficacy to psychological adjustment because our previous research indicated that there was significant relationship between them (Hirai et al., 2002). As we removed no significant paths from full path model (AIC=94.69), which contained all regressed paths to decisional-balance, until the AIC index of model became the least score (AIC=88.53) among the models, we obtained the final model as indicated in Figure 1. The model excellently fit the data ($\chi^2(26) = 36.53, p = 0.16$; GFI=0.93; AGFI=0.88; CFI=0.97; RMSEA=0.05; AIC=88.53) and accounted for 31% of total variance in decisional-balance by self-efficacy ($\beta = 0.48, p < 0.001$) and nausea ($\beta = -0.23, p < 0.01$).

Finally, we added a variable, the stage for outpatient chemotherapy, into the model in Figure 1. As we also tested the AIC index from the full path model (AIC=105.85), which contained all regressed paths to stage, to the model with the least AIC index (AIC=100.56), the final model represented in Figure 2, was obtained. Fit indices for this model were excellent: $\chi^2(37) = 42.56, p = 0.24$; GFI=0.93; AGFI=0.88; CFI=0.98; RMSEA=0.04; AIC=100.56. Overall, the final model accounted for 40% of the variance in stage for outpatient chemotherapy by decisional balance ($\beta = 0.60, p < 0.001$) and time from house to hospital ($\beta = -0.15, p < 0.10$).

Discussion

The findings from our study provided encouragement for adopting the TTM in the decision-making for outpatient chemotherapy in Japanese cancer care, although the applicability is limited. We think that the TTM is a very useful and universal framework

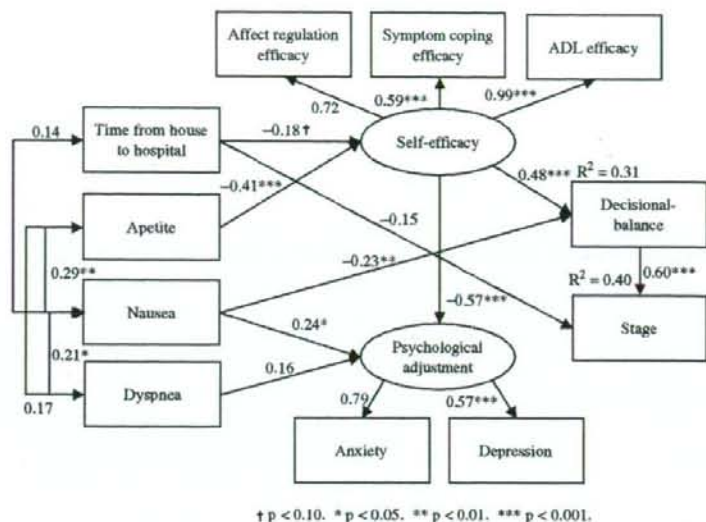


Figure 2. Structural model for stage of outpatient chemotherapy.

for clarifying behavioral problems, even if they are specific to a certain problematic phenomena in one domestic case.

First, the measurement for stage of change succeeded in classifying the participants into three stages: Contemplation, preparation, and action stages, and there were only four patients in the precontemplation stage. In the hospital where our survey was conducted, all lung cancer patients who were eligible for outpatient chemotherapy were informed about the options and availability of treatment by their physicians, and most of them understood that outpatient chemotherapy was one of their choices. This seems to be why only a few patients were in precontemplation. However, a number of patients ($N = 42$ [40%]) were still in contemplation and they were reluctant to choose the treatment as the immediate option, although they knew outpatient chemotherapy was an option for them. Therefore, the TTM indicated that a simple explanation of the treatment is insufficient to motivate patients to choose the option and that other factors influence patient decision making.

Second, we obtained a valid structural model, which explained the 40% of the variance in the advanced stage for outpatient chemotherapy. In our structural model, decisional-balance, which is the difference between the pros and cons, explained most of all the variance in stage progressed from contemplation to action. That is, patients who perceived high pros and low cons reached the action stage, while patients who perceived low pros and high cons remained in contemplation. This pattern of change in decisional-balance was consistent with the pattern indicated in basic assumption of the TTM (Prochaska & DiClemente, 1983), the result of the study of mammography (Rakowski et al., 1997), and that of the colorectal screening study (Manne et al., 2002). Therefore these results indicated that adoption of the TTM for outpatient chemotherapy was valid.

Third, in our structural model, demographic, physical and psychological variables significantly predicted the decisional-balance which mainly explained the stage of outpatient chemotherapy. Thus, decisional-balance mediates between demographic, physical and psychological variables, and the stages of readiness for outpatient chemotherapy. This model is also consistent with the theoretical assumption of the

TTM, in which decisional-balance is a mediating factor between the change of stage and other variables. In our model, the time from each participant's house to their respective hospital was the only demographic parameter to have a direct effect on stage, although it was a small parameter. It also showed that outpatient chemotherapy is an inconvenient option for patients who live far from a hospital, for example, more than 1 h away and the mean time from house to hospital was 46.19 min. Also, the reason nausea was a significant predictor of decisional-balance was explained by the fact that it is a significant side-effect of chemotherapy.

The interesting finding of this study was function of self-efficacy including affect regulation efficacy, symptom coping efficacy and ADL efficacy. Patients in the action stage showed significantly higher self-efficacy, and also the latent variable, self-efficacy was the significantly largest predictor of decisional-balance and psychological adjustment including anxiety and depression, and the mediating factor between environmental and physical variables and these outcome variables. Self-efficacy is one of the key components of the TTM (Prochaska & DiClemente, 1984) which explains stage transition, and previous studies showed that self-efficacy of cancer patients mediated between physical conditions and psychological adjustments (Beckham et al., 1997; Hirai et al., 2002). Our results are consistent with these theoretical assumptions and previous findings. Therefore, we have two possible explanations of the results. One is that patients' high self-efficacy becomes a motivator to make the transition to the action stage for outpatient chemotherapy and the other is that actual experiences in outpatient service and life in their own house enhanced their self-efficacy. In the first case, self-efficacy becomes a target for intervention to facilitate the transition to outpatient chemotherapy. In the latter case, since the transition to outpatient chemotherapy does not necessarily cause severe physical conditions or disability of daily living to the patients, recommendation of actual experiences for treatment reduces patients' cons and enhances self-efficacy.

We predicted that state of psychological adjustment, including anxiety and depression, would influence differences in stages or the decisional balance in the transition to outpatient chemotherapy. Although univariate analysis implied that patients in preparation were significantly more depressed compared to those in the other two stages, we could not obtain a statistically significant direct effect of depression or anxiety in our structural model. These suggest that the relationship between psychological adjustment and stage is not linear and mediated by self-efficacy, and that psychological adjustment was just a psychological outcome variable. They also implied that the severe depression of patients in preparation might be temporary deterioration in psychological adjustment, and that the actual transition to outpatient chemotherapy might not make patients highly anxious or highly depressed. Therefore, we concluded that recommending the transition to outpatient chemotherapy would not have any negative psychological impact on patients.

There are several clinical implications of the results in this study. First, it is beneficial for medical staff to evaluate subjective components, including decisional-balance and self-efficacy, in patients who are eligible for outpatient chemotherapy. To evaluate decisional-balance, individual differences and inpatients' pros and cons allow medical staff to make an individualized care plan and give adequate information to patients. Second, it may be possible to develop an intervention program combining the TTM-based screening with enhanced self-efficacy. TTM-based screening consists of two psychological assessments, including our single item for measuring the stage and our decisional-balance scale for psychological eligibility

for outpatient chemotherapy. These instruments can clarify the patient's stage of readiness and describe current patient preferences and concerns regarding therapy.

This study has several limitations. The first is that it was cross-sectional in design. Although we could not definitely conclude causality in the relationship among variables, the SEM results have provided strong evidences and insights for future planning of longitudinal studies. Second, the sample of this study was comparatively small and limited to patients in one institution. Therefore, one important suggestion for future research is to use a longitudinal design and multi-center trial. Third, decision making for outpatient chemotherapy is a domestic problem based on the Japanese medical system. If the Japanese Ministry of Health decides to cover outpatient chemotherapy more fully with national health insurance, patients' willingness to transition may change. However, this study shows high applicability of TTM to specific domestic problems, such as outpatient chemotherapy in Japanese lung cancer patients, and that the psychological theory could provide a useful solution. This will encourage psychologists to adapt applied behavioral theory, such as TTM, to other specific behavioral problems in cancer care settings and other medical problems.

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Palliative care needs of cancer outpatients receiving chemotherapy: an audit of a clinical screening project

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Abstract

Purpose Although more and more cancer patients are receiving chemotherapy in outpatient settings in their

advanced stage and could have a broad range of palliative care needs, referral to the specialized palliative care service is often delayed. The primary aim of this study is to explore the usefulness of a combined intervention for cancer patients in identifying patients with underrecognized palliative care needs and referring them to the specialized palliative care service. The intervention consisted of (1) introducing the specialized palliative care service when starting chemotherapy, (2) using screening tools, and (3) providing on-demand specialized palliative care service.

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Materials and methods All cancer patients newly starting chemotherapy with primary tumor sites of the lung, gastrointestinal, pancreas, bile duct, breast, ovary, and uterus were included. As routine practice, at the first instruction about chemotherapy, pharmacists provided information about the role of the specialized palliative care service using a pamphlet and handed out screening questionnaires. Screening questionnaires were distributed at every hospital visit. Treating physicians and/or nurses checked the questionnaire before examining the patients. The patients were referred to the palliative care team, if (1) the patients voluntarily wished for the specialized palliative care service or (2) the treating physicians clinically determined that, on the basis of the screening results, the patients had physical or psychological needs appropriate for referral to the specialized palliative care service. The screening questionnaire included an open-ended question about their greatest concerns, the severity of 11 physical symptoms, overall quality-of-life, the distress thermometer, help for information about the treatment and decision-making, economic problems, nutri-

tion, daily activities, and wish for help from the specialized palliative care service.

Results Of 211 patients who newly started chemotherapy, 5 patients refused to complete the questionnaire (compliance rate, 98%). We obtained 1,000 questionnaires from 206 patients. The percentages of missing values ranged from 2.7% to 7.0%. Of 206 patients, 38 (18%) were referred to the palliative care team due to newly recognized problems, in addition to 10 patients with problems well-recognized by primary physicians. The total percentage of patients receiving specialized palliative care service was thus 23% of all patients. Frequently identified problems were oral problems (20%), insomnia (20%), help with information and decision-making (16%), psychological distress defined as the distress thermometer (14%), severe fatigue (9.0%), and severe appetite loss (8.8%). As a whole, problems were identified in half of all questionnaires.

Conclusion The combined intervention of introducing the specialized palliative care service, using screening tools and providing on-demand specialized palliative care service, was feasible as part of the routine clinical practice for all cancer patients starting chemotherapy. It might be useful in identifying patients with underrecognized palliative care needs and referring them to the specialized palliative care service at the appropriate time.

Keywords Palliative care team · Neoplasms · Screening · Chemotherapy head · Outpatient

Introduction

The recent literature indicates that more and more cancer patients receive chemotherapy in outpatient settings in their advanced stage [1]. They have a broad range of palliative care needs including physical symptoms, psychological distress, help with decision-making, and economical and practical support [2–7]. Conceptually, palliative care can and should be provided for all patients along with disease-modifying treatment [8]. Referral to the specialized palliative care service is, however, often delayed because patients regard receiving palliative care as an *alternative*, not an additional, resource of anticancer treatment [9–11]. Introducing the specialized palliative care service as an additional resource to improve the quality-of-life of all patients at the earlier stage of cancer treatment, focusing on patient distress not on the stage of the disease, can be a

useful strategy to provide adequate palliative care [12]. Several intervention trials have suggested that the routine use and feedback to the treating physicians of quality-of-life measurements or symptom assessment scales could contribute to improving physician recognition of patient quality-of-life aspects with some beneficial effects on patient psychological well-being [13–17]. On the other hand, some clinical trials including more intensive interventions, such as cognitive behavior intervention with systematic identification of patient needs, have demonstrated positive outcomes in patient physical well-being, not only psychological issues [18–22]. In addition, multidisciplinary intervention by specialized palliative care teams in outpatient settings could contribute to enhancing patient quality-of-life [23–26]. These findings suggest that a combined intervention of (1) introducing the specialized palliative care service at the earlier stage of disease trajectory, (2) using screening tools, and (3) providing on-demand specialized palliative care might contribute to a better quality-of-life for cancer patients receiving active anticancer treatment.

The primary aim of this project is to explore the usefulness of such intervention in identifying patients with underrecognized palliative care needs and referring them to the specialized palliative care service. An additional aim was to clarify the prevalence of physical and psychological symptoms and concerns among a heterogeneous sample of cancer patients receiving outpatient chemotherapy in a regional cancer center.

Materials and methods

This brief descriptive study included all cancer patients newly starting chemotherapy with primary tumor sites of the lung, gastrointestinal, pancreas, bile duct, breast, ovary, and uterus from April to October 2006. We had decided to include the patients receiving adjuvant chemotherapy because they might receive some benefit from professional emotional support by a member of the palliative care team (the leading department of this project is the Department of Palliative and Supportive Care). As part of the routine practice, at the first instruction about chemotherapy, pharmacists provided information about the role of the specialized palliative care service using a pamphlet and handed out screening questionnaires with coaching on how to complete them. Screening questionnaires were thereafter distributed at every hospital visit. If the patients refused to complete

the questionnaire or recognized no need, they were not obliged to complete the questionnaire.

Treating physicians and/or nurses checked the screening questionnaire before examining the patients. The patients were referred to the palliative care team, if (1) the patients voluntarily wished for the specialized palliative care service or (2) the treating physicians determined that, on the basis of the screening results, the patients had physical or psychological needs appropriate for referral to the specialized palliative care service. Although we instructed the physicians to consider the scores of 5 or more as a threshold for the screening, the decision whether the treating physicians referred patients to the palliative care team was clinically made due to no established cutoff points. In addition, a research nurse provided brief feedback about the screening results via the electronic medical recording system.

Palliative care team activity is widespread throughout our hospital and could respond to all consultations within a few days [27, 28].

Screening questionnaire

The study group constructed the screening questionnaire on the basis of existing validated instruments [29–33]. As the primary intention of this activity was to identify patients with underrecognized needs and facilitate their referral to the specialized palliative care service within the routine clinical practice, not to clarify the exact prevalence of each need, we decided to make the questionnaire as simple and short as possible.

The screening questionnaire included (1) an open-ended question about the greatest concerns of patients; (2) 0–10 numeric rating scales of 8 physical symptoms (pain, dyspnea, nausea, appetite loss, somnolence, fatigue, constipation/diarrhea, numbness) adopted from the Japanese version of the M.D. Anderson Symptom Inventory (MDASI) after modification of the interval (24 h to 1 week) and the timing (worst to average severity) [29]; (3) presence or absence of oral problems, fever, and insomnia; (4) 0–7 numeric rating scale of overall quality-of-life adopted from item 29 of the EORTC-C30 [30]; (5) the distress thermometer [31, 32]; (6) presence or absence of help in 4 areas, i.e., information about the treatment and decision-making, economic problems, nutrition, and daily activities [33]; and (7) wish for help of the specialized palliative care service (see Appendix).

Our hospital required no Institutional Review Board approval for the retrospective analysis of clinical activity,

but admitted patients gave written consent that their clinical information could be used for clinical research.

Analyses

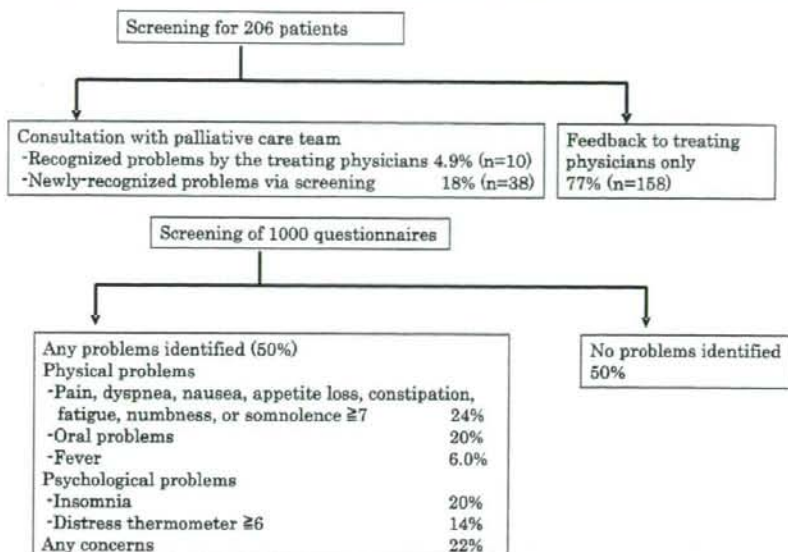
The primary endpoint was the number of patients referred to the palliative care team after treating physicians and/or nurses recognized patient needs via the screening questionnaire.

As additional endpoints, the prevalence of problems was calculated for each visit. For calculations, we adopted ad hoc definition of moderate and severe symptom definition for the MDASI items as 4–6 and 7–10, respectively. We used cutoff points on the distress thermometer of 6 or more following the previous findings [31, 32]. We determined that a patient had problems if he/she had either MDASI symptoms of 7 or more, oral problem, fever, insomnia, distress thermometer of 6 or more or any help with

Table 1 Patient backgrounds (*n*=206)

Summary of patient backgrounds	
Age	62±11 years
Sex	
Male	41% (<i>n</i> =84)
Female	59% (<i>n</i> =122)
Primary sites	
Lung	30% (<i>n</i> =62)
Breast	27% (<i>n</i> =56)
Colon, rectum	15% (<i>n</i> =31)
Stomach	13% (<i>n</i> =26)
Uterus, ovary	10% (<i>n</i> =21)
Pancreas, bile duct	2.9% (<i>n</i> =6)
Others	3.9% (<i>n</i> =8)
Chemotherapy regimens	
Taxanes	27% (<i>n</i> =55)
Carboplatin and taxanes	19% (<i>n</i> =39)
Doxorubicin and cyclophosphamide	12% (<i>n</i> =25)
Oral tegafur gimeracil oteracil	11% (<i>n</i> =22)
Fluorouracil	10% (<i>n</i> =21)
Gemcitabine	3.4% (<i>n</i> =7)
Irinotecan with/without taxanes	2.9% (<i>n</i> =6)
Transtumab with/without taxanes	2.9% (<i>n</i> =6)
Cyclophosphamide, methotrexate, and fluorouracil	2.4% (<i>n</i> =5)
Gefitinib	1.5% (<i>n</i> =3)
Low-dose cisplatin and 5-fluorouracil	1.5% (<i>n</i> =3)
Vinorelbine	1.0% (<i>n</i> =2)
Oxaliplatin and 5-fluorouracil/leucovorin	1.0% (<i>n</i> =2)
Oral capecitabine	1.0% (<i>n</i> =2)
Others	3.4% (<i>n</i> =7)

Fig. 1 Results



information and decision-making, nutrition, economic problems or daily activities.

Results

During this study interval, of 211 patients who newly started chemotherapy, 5 patients refused to complete the screening questionnaire (compliance rate, 98%). Each patient completed a median of 3.0 screening questionnaires during this study period (range 0–15) and we obtained 1,000 questionnaires from 206 patients. The percentages of missing values ranged from 2.7% (appetite loss) to 7.0% (distress thermometer). Table 1 summarizes the patient backgrounds.

Of 206 patients who completed the initial questionnaire, 38 (18%) were referred to the palliative care team due to newly recognized problems via the screening tool, in addition to 10 patients who consulted the palliative care team due to well-recognized problems (Fig. 1). The percentage of patients receiving the specialized palliative care service was thus 23% of all patients by treating physicians (48/206).

The main reasons for the referral via the screening tool were: psychological distress (58% of 38 patients, $n=22$), appetite loss/nausea/constipation (26%, $n=10$), pain (24%,

$n=9$), numbness (13%, $n=5$), fatigue (13%, $n=5$), and dyspnea/cough (5.3%, $n=2$). On the other hand, the main symptoms of the patients who consulted the palliative care team due to well-recognized problems were: pain (40% of 10 patients, $n=4$), dyspnea (30%, $n=3$), delirium (20%, $n=2$), and psychological distress (10%, $n=1$).

For the questionnaire level (Table 2), frequently identified problems were oral problems (20%), insomnia (20%), help with information and decision-making (16%), psychological distress (defined as the distress thermometer ≥ 6 ; 14%), severe fatigue (9.0%), and severe appetite loss (8.8%). As a whole, problems were identified in half of all questionnaires (Fig. 1).

Discussion

The first important finding of this study was the feasibility of our clinical intervention. The percentage of patients who completed the screening questionnaire at instruction was over 90%. The percentages of missing values in each screening item were below 7.0%. These findings demonstrated that this intervention was feasible for the majority of cancer patients receiving chemotherapy as part of the routine clinical practice.

The second important finding was the potential usefulness of our intervention in identifying patients with under-