Research article
A Cross-Sectional Survey of Factors Influencing Patients' Attitudes to Cancer Treatment

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Abstract

Objective: The aim was to identify factors influencing patient motivation for cancer treatment to obtain information for the realization of satisfactory survivorship. Methods: A 44-item questionnaire survey was conducted with cancer patients attending three university hospitals in Japan between September 2015 and January 2016. The relationships of patient motivation for treatment with patient background factors (cancer type, sex, age, performance status, treatment content, and family environment), treating physician's judgment, physical/emotional symptoms, impact on job (work or housework, job performance), and economic status were investigated. Results: Completed questionnaires were collected from 969 patients (response rate, 88.4%).A multivariate logistic regression analysis showed that treating physician's judgment to recommend the patient to receive treatment (odds ratio [OR] = 1.88, p = 0.049) and patient concern about disease progression (OR = 1.39, p = 0.007) were significantly correlated with greater patient motivation for treatment. Impact on job (being unable to work or do housework as before) (OR = 0.38, p = 0.011) and economic status (reduced patient income) (OR = 0.39, p = 0.023) were significantly correlated with lower patient motivation for treatment. Conclusion: This is the first study of patients with a wide range of cancer types to explore factors influencing patient motivation for treatment. Four influencing factors were identified. Further research is needed to determine whether supportive measures for these factors are useful in enhancing cancer survivors' motivation for treatment.

Introduction

In Japan, the number of cancer patients continues to increase every year, with an estimated more than one million patients in 2018 [1]. Although cancer remains the leading cause of death, the age-standardized rate has tended to decrease. This indicates that improvements in early detection rates and advances in cancer treatment, such as surgical therapy, radiation therapy, and anticancer drug therapy, have increased the number of long-term cancer survivors. In September 2018, the National Cancer Center Japan calculated the 3-year (relative) survival rate for 11 common cancers in 306,000 patients at 268 cancer-designated hospitals [2]. Survival rates are increasing, not only for prostate cancer and breast cancer, but also for intractable cancers such as lung cancer, changing the perception of cancer from a fatal serious disease to a coexisting disease.

In this context, the term "cancer survivorship" is increasingly used. In 1985, Mullan, who experienced cancer himself, stated that an individual should be considered a cancer survivor from the time of cancer diagnosis[3]. Based on this concept, the National Coalition for Cancer Survivorship suggested in 1986 that cancer survivorship should be defined as the remainder of the life of an individual following a cancer diagnosis [4]. Hewitt et al. have stated that survivorship care should be provided to long-term survivors who are disease-free after completion of treatment or who require chronic or intermittent management owing to the effects of cancer treatment [5]. Many cancer survivors receiving treatment feel isolated, not only in terms of physical discomfort but also because of other factors, such as various worries, general anxiety, and economic problems. Therefore, patient decision-making is likely to be strongly affected by both medical aspects and non-medical factors, including age, family structure, social relationships, survival rate, and baseline quality of life (QOL). In the present study, a questionnaire survey was conducted to identify factors that influence patient motivation for treatment with an aim to provide optimal support for decision-making in cancer survivors. Although there are several studies involving several hundred patients with single-organ cancer (e.g., breast cancer, lung cancer, or colorectal cancer) [6,7,8], this is the first study to analyze responses from nearly 1,000 patients with various cancer types. The study results may be useful in developing strategies for satisfactory survivorship.

Methods
Subjects

Cancer patients who were scheduled to be treated, were being treated, or had completed treatment on an outpatient basis at Teikyo University Hospital, Kyorin University Hospital or Tokyo women's medical University Hospital, Japan, between September 2015 and January 2016 were enrolled in the study. Patients who met all of the following inclusion criteria were eligible for participation: older than 20 years of age; ECOG performance status (PS) of 0-3; and provision of informed consent to participate in the study. Here, ECOG PS is a scale used to assess how the cancer affects the daily living abilities of the patient. Patients were assigned PS of 0 if they were fully active and able to carry on all pre-disease performance without restriction, PS of 1 if restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, PS of 2 if ambulatory and capable of all self care but unable to carry out any work activities; up and about more than 50% of waking hours, and PS of 3 if capable of only limited self-care; confined to bed or chair more than 50% of waking hours. The estimated number of valid responses was 150–200 per hospital. Assuming a response rate of 60% based on those in previous similar surveys and taking invalid responses into account, 900 questionnaires needed to be delivered (300 copies per hospital).

Procedure

After receiving an oral explanation of the study from a treating physician using written information and providing informed consent for participation, eligible patients as described above were given a self-administered anonymous questionnaire and asked to return it to a collection box at each site or to the secretariat by mail. Patients were finally considered to have provided informed consent by returning the questionnaire. A physician form specifying disease, age, treatment content, general condition, and other information was collected from each treating physician. This study was approved by the ethical review boards of Teikyo University ,Kyorin University, and Tokyo Women's Medical University.

Survey items

The patient-completed questionnaire comprised 33 items with three to five response options per item. In addition to one item about patient motivation for treatment, there were two about the patient's disease, two about treatment, two about cancer history, five about hospital visits, six about family environment/social status, five about current symptoms (including physical/emotional symptoms and activity status), one about health management, two about work, two about home healthcare, and five about economic status/economic burden.

As the study included cancer patients who were scheduled to be treated, were being treated, or had completed treatment, there were three response options for patient motivation for treatment: "willing to receive treatment," "very anxious, but decided to receive treatment," and "actually reluctant to receive treatment, but convinced by family to do so." The treating physician-completed questionnaire comprised 12 items with two to four response options per item. There were three items about patient background factors (sex, age,

and PS),two about diagnosis and treatment content, five about cancer history, and two about treating physician's judgment (patient motivation for treatment and whether to recommend the patient to receive treatment

Statistical analysis

The relationships between patient motivation for treatment and responses to 44 survey items were analyzed. Patient motivation for treatment was classified into two categories: positive about treatment if "willing to receive treatment" was selected and not positive about treatment if "very anxious, but decided to receive treatment" or "actually reluctant to receive treatment, but convinced by family to do so" was selected. To determine the relationships between patient motivation for treatment and responses to 44 items, univariate logistic regression analysis was initially performed with the former as the dependent variable and the latter as the independent variables. Multivariate logistic regression analysis was then performed using all items evaluated by univariate analysis. Statistical analyses were performed using EZR software (Jichi Medical University Saitama Medical Center, Saitama, Japan), which is the graphical user interface for R (The R Foundation for Statistical Computing, Vienna, Austria) [9]. The level of significance was 5%. In the logistic regression analysis, factors with odds ratios (OR) greater than 1 were associated with patient positive attitude toward treatment, and factors with ORs less than 1 were associated with patient negative attitude toward treatment.

Results
Patient background

As 800 of the 900 distributed questionnaires were returned, the sample size was increased to 1,200 to obtain more accurate data. A final total of 1,099 patients were asked to complete questionnaires, and 969 returned questionnaires (response rate, 88.4%).
Subject background characteristics are shown in Table 1. The median age was 68 years, and there was no difference between the proportions of males and females. The PS was 0 or 1 in 96% of all patients; 17% had breast cancer, 16% lung cancer, 11% gastric cancer, and 10% pancreatic cancer, accounting for approximately half of all patients. The most common treatments were anticancer drug therapy (50%), surgical therapy (27%), radiation therapy (16%), endocrine therapy, and palliative care alone.

A total of 56% of patients were "willing to receive treatment," 26% were "very anxious, but decided to receive treatment," and 2% were "actually reluctant to receive treatment, but convinced by family to do so." There was no response/invalid response for 16% of patients.

In more than 90% of cases, the treating physician judged that the patient was positive about

treatment and judged to recommend the patient to receive treatment.

Relationships between patient motivation for treatment and patient background factors

Table 2 shows the results of the univariate logistic regression analyses of patient motivation for treatment and patient background factors. Of the patient background factors, increased PS (OR=1.53, p < 0.001), breast cancer (OR=1.58, p=0.022), and hormonal therapy (OR=1.79, p=0.010) were significantly correlated with greater patient motivation for treatment. Lung cancer (OR = 0.62, p = 0.009), liver cancer (OR = 0.60, p = 0.045), and anticancer drug therapy(OR=0.65,p=0.006)were significantly correlated with lower patient motivation for treatment.

Relationships between patient motivation for treatment and treating physician's judgment

Table 3 shows the results of the univariate logistic regression analyses of patient motivation for treatment and treating physician's judgment. Of treating physician's judgments, judgment that the patient was positive about treatment (OR = 1.51, p < 0.001) and judgment to recommend the patient to receive treatment(OR=1.48, p=0.001)were significantly correlated with greater patient motivation for treatment.

Relationships between patient motivation for treatment and physical/emotional symptoms

Table 4 shows the results of the univariate logistic regression analyses of patient motivation for treatment and physical/emotional symptoms. Of physical symptoms, being sometimes sick in bed (OR = 1.27, p < 0.001) was significantly correlated with greater patient motivation for treatment. Lack of physical symptoms (OR = 0.81, p = 0.031) was significantly correlated with lower patient motivation for treatment Of emotional symptoms, concern about disease progression (OR = 1.19, p < 0.001) was significantly correlated with greater patient motivation for treatment. Full acceptance of own disease (OR = 0.76, p < 0.001) was significantly correlated with lower patient motivation for treatment.

Relationships between patient motivation for treatment and impact on job (work or housework)/economic status

Table 5 shows the results of the univariate logistic regression analyses of patient motivation for treatment and impact on job (work or housework) / economic status. Regarding the impact on job (work or housework), lack of impact on job (work or housework) (OR=1.73, p=0.002) was significantly correlated with greater patient motivation for treatment. Being unable to work or do housework as before (OR = 0.51, p < 0.001), increased absence from

Table 1. Patient background characteristics

	Number of subjects	n = 969		%
Age	Median		68	
Sex	Male	485		50
	Female	463		48
	No response/invalid response	21		2
General condition: PS (ECOG)	0	675		70
	1	248		26
	2	21		2
	3	10		1
	No response/invalid response	15		1
Marital status	Unmarried	106		11
	Married (lives with spouse)	634		65
	Married (lives separately from spouse)	25		3
	Married (widowed or divorced)	173		18
	No response/invalid response	31		3
Family structure	Lives alone	157		16
	Couple household	336		35
	Two-generation household (patient or patient couple and children)	318		33
	Two-generation household (patient or patient couple and parents)	35		4
	Three-generation household (parents, children, and grandchildren)	72		7
	Other	28		3
	No response/invalid response	23		2
Diagnosed cancer type	Breast	162		17
	Lung	151		16
	Gastric	103		11
	Pancreatic	95		10
	Colorectal	76		8
	Esophageal	50		5
	Liver	41		4
	Brain	33		3
	Prostate	26		3
	Other	139		13
	No response/invalid response	93		10
Treatment content	Anticancer drug therapy	457		39
	Surgery	323		27
	Radiation therapy	194		16
	Hormonal therapy	125		11
	Endoscopic therapy	56		5
	Palliative care such as pain relief	23		2
Patient motivation for treatment answered by patient	Willing to receive treatment	539		56
	Very anxious, but decided to receive treatment	252		26

PS: performance status; ECOG: Eastern Cooperative Oncology Group.

Table 2. Univariate logistic regression analyses of patient motivation for treatment and patient background factors.

| | | | Odds ratio | 95% confidence interval | | p-value |
				Lower limit	Upper limit	
Baseline characteristics	Sex	Male	1.23	0.91	1.65	0.174
	Age	>70 years old	1.12	0.83	1.50	0.462
	Performance status	getting worse	1.53	1.19	1.95	<0.001
	Family structure	lives alone	0.95	0.64	1.41	0.787
	Marital status	unmarried	0.82	0.52	1.28	0.378
Cancer type	Breast		1.58	1.07	2.33	0.022
	Colorectal		0.79	0.51	1.22	0.282
	Gastric		1.22	0.76	1.95	0.405
	Lung		0.62	0.43	0.89	0.009
	Liver		0.6	0.37	0.99	0.045
Treatment content	Surgery		0.98	0.71	1.330	0.879
	Endoscopic therapy		1.20	0.63	2.28	0.582
	Radiation therapy		0.96	0.67	1.36	0.798
	Anticancer drug therapy		0.65	0.48	0.89	0.006
	Hormonal therapy		1.79	1.15	2.80	0.010
	Palliative care such as pain relief		1.42	0.51	3.99	0.506

Table 3. Univariate logistic regression analyses of patient motivation for treatment and treating physician's judgment.

| | | Very positive | | Positive | | Anxious | | Very anxious | | No response/invalid response | | | 95% confidence interval | | |
		n	%	n	%	n	%	n	%	n	%	Odds ration	Lower Limit	Upper Limit	p-value
Treating physician's judgment	The patient is positive about treatment	465	58	288	35	41	5	7	1	7	1	1.51	1.2	1.9	<0.001
	Recommend the patient to receive treatment	472	58	279	34	36	5	3	1	18	2	1.48	1.16	1.89	0.001

Table 4. Univariate logistic regression analyses of patient motivation for treatment and physical/emotional symptoms.

| | | Not applicable at all | | Slightly applicable | | Moderately applicable | | Fairly applicable | | Highly applicable | | No response/invalid response | | | 95% confidence interval | | |
		n	%	n	%	n	%	n	%	n	%	n	%	Odds ratio	Lower limit	Upper limit	p-value
Physical symptoms	No physical symptoms	29	4	81	10	-		287	36	372	46	39	4	0.81	0.66	0.98	0.031
	Sometimes sick in bed	152	19	127	16	78	10	55	7	22	3	374	45	1.27	1.08	1.49	<0.001
	Pain	196	25	109	13	68	8	27	3	23	3	385	48	1.14	0.97	1.35	0.124
Emotional symptoms	Fully accepted my disease	22	3	58	7	133	16	286	35	280	35	29	4	0.76	0.66	0.88	<0.001
	Concerned about disease progression	119	14	197	24	190	24	127	16	146	18	29	4	1.19	1.10	1.28	<0.001

work or housework (OR = 0.58, p = 0.045), and reduced income (OR=0.58, p= 0.018) were significantly correlated with lower patient motivation for treatment.

Regarding economic status, no burden of medical costs (OR = 1.89, p = 0.003) was significantly correlated with greater patient motivation for treatment. Being very anxious about substantial medical cost burden (OR= 0.48, p < 0.001) was significantly correlated with lower patient motivation for treatment.

Results of multivariate logistic regression analysis of factors related to patient motivation for treatment

Table 6 shows the results of the multivariate logistic regression analysis. Treating physician's judgment to recommend the patient to receive treatment (OR = 1.88, p = 0.049) and patient concern about disease progression (OR = 1.39, p = 0.007) were significantly correlated with greater patient motivation for treatment. Being unable to work or do housework as before (OR = 0.38, p = 0.011) and reduced patient income (OR = 0.39, p = 0.023) were significantly correlated with lower patient motivation for treatment.

Discussion

In this study, the relationships between patient motivation for treatment and patient background factors (cancer type, sex, age, PS, treatment content, and family environment),treating physician's judgment, Physical/ emotional symptoms, impact on job (work or housework, job performance), and economic status were investigated to determine which factors induce cancer patients to be positive about treatment..

The multivariate logistic regression analysis showed no correlation between patient motivation for treatment and patient background factors or social status. On the other hand, treating physician's judgment to recommend the patient to receive treatment and patient concern about disease progression were significantly correlated with greater patient motivation for treatment.

The disease impact on jobs (being unable to work or do housework as before) and economic status (reduced patient income) were significantly correlated with lower patient motivation for treatment.

Although there are several studies on factors related to motivation for treatment in patients with breast cancer, colorectal cancer, or lung cancer, and on the association between treatment motivation and treatment content [6-8], this is the first study to include patients with a wide range of cancers. Contrary to previous reports, the present findings indicated that motivation for treatment did not differ according to cancer type.

Table 5. Univariate logistic regression analyses of patient motivation for treatment and impact on job (work or housework)/economic status.

		Not applicable		Applicable		No response/invalid response			95% confidence interval		
		n	%	n	%	n	%	Odds ratio	Lower limit	Upper limit	p-value
Impact on job	No impact	457	57	251	31	100	12	1.73	1.23	2.44	0.002
	Unable to work or do housework as before	578	72	130	16	100	12	0.51	0.35	0.75	<0.001
	Increased absence from work	647	80	61	8	100	12	0.58	0.34	0.99	0.045
	Quit my job	574	71	134	17	100	12	0.81	0.54	1.19	0.281
	Reduced income	616	76	92	11	100	12	0.58	0.37	0.91	0.018
Economic status	No burden of medical costs	620	77	145	18	43	5	1.89	1.23	2.89	0.003
	Very anxious about substantial medical cost burden	620	77	145	18	43	5	0.48	0.33	0.7	<0.001

Table 6. Multivariate logistic regression analysis of factors related to patient motivation for treatment.

				95% confidence interval		
			Odds ratio	Lower limit	Upper limit	p-value
Baseline characteristics	Sex	Male	1.35	0.70	2.60	0.372
	Age	>70 years old	1.03	0.53	2.01	0.925
	Performance status	getting worse	1.34	0.69	2.58	0.385
	Family structure	lives alone	0.55	0.18	1.68	0.291
	Marital status	unmarried	2.50	0.74	8.47	0.140
Treating physician's judgment	The patient is positive about treatment		0.85	0.48	1.50	0.571
	Recommend the patient to receive treatment		1.88	1	3.52	0.049
Cancer type	Breast		1.15	0.41	3.24	0.793
	Colorectal		0.73	0.32	1.68	0.456
	Gastric		0.73	0.30	1.73	0.469
	Lung		0.81	0.38	1.74	0.589
	Liver		0.45	0.15	1.37	0.159
Treatment content	Surgery		0.92	0.47	1.8	0.805
	Endoscopic therapy		0.88	0.17	4.45	0.876
	Radiation therapy		0.57	0.28	1.16	0.120
	Anticancer drug therapy		1.27	0.63	2.55	0.509
	Hormonal therapy		3.39	0.89	12.9	0.073
	Palliative care such as pain relief		1.45	0.35	5.94	0.608
Physical/emotional symptoms	No physical symptoms		1.16	0.81	1.67	0.411
	Sometimes sick in bed		0.94	0.69	1.29	0.709
	Pain		1.07	0.81	1.41	0.653
	Concerned about disease progression		1.39	1.10	1.77	0.007
	Fully accepted my disease		0.84	0.64	1.09	0.192
Impact on job/economic status	No impact		0.56	0.26	1.20	0.136
	Unable to work or do housework as before		0.38	0.18	0.80	0.011
	Increased absence from work		1.01	0.36	2.82	0.991
	Quit my job		0.62	0.27	1.42	0.257
	Reduced income		0.39	0.17	0.88	0.023
	No burden of medical costs		0.77	0.31	1.92	0.572
	Very anxious about substantial medical cost burden		0.62	0.32	1.22	0.166

Treating physician's judgment about patient condition

The multivariate logistic regression analysis showed that treating physician's judgment to recommend the patient to receive treatment was associated with patient positive attitude toward treatment. A previous study reported that physician recommendation had the strongest influence on patient motivation for treatment, especially in elderly people [10]. Here, the criteria for patient eligibility for treatment assessed by physicians are discussed. A Pub Med search of articles published from 1966 to 2010 shows that physicians draw on their beliefs, values, and medical expertise and practice, as well as the estimated life expectancy of an elderly patient, medical factors, and communication skills to determine whether treatment is indicated [11]. In other words, physicians' subjective judgment plays a primary role in treatment recommendation, and there are no clear standardized assessment criteria. One previous study reported that clinicians caused the unnecessary deaths of elderly patients by minimizing treatment simply because of advanced age [12]. Therefore, treatment decisions should be made carefully, especially for patients with cancer that may be curable or is in the early stages. Exclusion of elderly patients from standard treatment based solely on age can be prevented by predicting toxicity using Cancer and Aging Research Group scores or Chemotherapy Risk Assessment Scale for High-Age Patients scores to determine treatment risk in individual patients, or by predicting the probability of death using Geriatric-8 scores or Vulnerable Elders Survey-13 scores [13]. Recent reports have identified tools useful in predicting the prognosis of frail patients, such as the Deficit Accumulation Frailty Index, or improving the QOL [14]. Therefore, the merits and demerits of treatment in individual patients should be evaluated objectively when devising a therapeutic strategy.

What is needed for patient emotional anxiety?

In this study, patients concerned about disease progression were positive about treatment to a statistically significant degree. Concerns of cancer patients have evolved over the 30 years from 1980 to 2010, from concerns about physical symptoms such as nausea, vomiting, and hair loss to worries about the disease impact on social life, such as effects on family members, housework or work, and social activities [15]. In an examination of what type of supportive care was needed to improve psychological distress and QOL in patients, Sakamoto et al. found that what patients needed most was psychological support that reduced the fear of treatment, which was statistically significant. This tended to be more marked in women, and the authors suggested that therapeutic intervention that reduces psychological distress and increases QOL may increase patient satisfaction with treatment and thereby enhance patient motivation for treatment [16]. As pessimistic patients may have difficulty in selecting treatment, it is also important not to underestimate the prognosis and to reduce patient anxiety [17]. Additional studies are needed to examine changes in motivation for treatment caused by early intervention with emotional support. As cancer patient decision-making is complicated by increased physical burden such as pain [18], early therapeutic intervention for physical symptoms may be important, although the present study showed no statistically significant correlation between patient treatment motivation and physical symptoms.

Survivor impaired job performance

Employment plays an essential role in the QOL of cancer survivors [19-21]. Nonetheless, some cancer survivors face work problems such as difficulty in returning to work, lower wages, and unemployment [22-26]. According to one epidemiological study, the unemployment rate for cancer survivors is 1.4 times that of healthy individuals, despite the importance of returning to work for survivors [27]. In addition, an average of only 60% of patients with a cancer diagnosis return to work [28]. Currently, 1 in 3 cancer patients in Japan are of working age (15-64 years) [29]. Many patients are forced to leave their job after a cancer diagnosis or do not receive adequate consideration from their employers; this is perhaps understandable as there is a perception in Japanese society that cancer has a poor prognosis [30]. For cancer survivors of working age (productive age), difficulty in returning to work is not only an individual problem, but also causes family and social problems, resulting in substantial medical system costs and economic loss. It is important to consider work problems and work support for cancer survivors, and there have been several studies on this topic [31,32]; however, much remains unknown about the actual conditions, requiring further studies.

In the present study, the multivariate logistic regression analysis showed that patients unable to work as before were negative about treatment. Several studies indicate that depression is associated with decreased job performance [33-37]. As mentioned above, pessimistic patients have difficulty in selecting treatment [15]; therefore, decreased job performance results in impaired patient decision-making. Eversley et al. reported that 40% of patients receiving treatment changed their jobs, 17% were dismissed, and 29% were harassed in the workplace [38]. Many studies have shown that support from managers and colleagues in the workplace improves impaired job performance in cancer survivors [39,40,41,42]. This indicates the importance of such support, which may enhance patient motivation for treatment.

Reduced income

In this study, 60% of men and 52% of women reported a reduction in income. Takahashi et al. reported that 30% to 40% of cancer survivors of working age left their jobs, took days off, or were dismissed, and approximately 50% experienced a reduction in income [43-47]. According to their study, 51% of men and 60% of women experienced no changes in income after

developing cancer, but 44% of men and 36% of women experienced a reduction in income. An annual income reduction occurred more frequently in men (12%) than in women (4%). A reduced income owing to work changes is associated with depression and anxiety, which tend to be more marked in men than in women [48]. In contrast, the present findings showed no significant correlation between patient motivation for treatment and quitting a job. A survey of work in current and former cancer patients showed that 34% of employees voluntarily resigned or were dismissed [45]. Many issues therefore remain to be addressed regarding subsequent changes in economic status and return to work in cancer survivors. According to a survey conducted by the National Cancer Center Hospital East, Japan, 6% of cancer patients of working age had left their jobs at the first visit to a cancer hospital. In reply to the question "When would you consider leaving your job?" 46% and 26%, respectively, responded "When I am told that cancer is suspected" and "When a cancer diagnosis is established," and 30% to 40% left their jobs within 2 years of a cancer diagnosis [43]. With advances in cancer treatment, the conditional survival rate of cancer patients is increasing annually [49]. Multifaceted patient support is an important component of medical cancer care, including early commencement of physical/emotional support and various types of work support.

The present study had several limitations. First, although this was a cross-sectional study, individual patient treatment stage (initial treatment, follow-up, recurrence, supportive care only) was not recorded on the survey. Second, 16% of responses for the item on patient motivation for treatment were missing or invalid; this was the most common response to this item. This item did not contain a response option of "not receive treatment," which may have limited patient options. All participants were from university hospitals with abundant medical resources that provided high-quality cancer treatment, and so were expected to be mostly positive about treatment. Therefore, a potential bias in the study population cannot be ruled out and the results may not be applicable to the overall cancer patient population. Third, only ambulatory patients were enrolled in the study. More specifically, as the PS was 0 or 1 in 96% of all patients, a selection bias that treating physician asked commonly the patients with low levels of PS to cooperate in the survey may have occurred.

Conclusion

This is the first study to explore factors that influence treatment motivation in patients with various types of cancer. Four influencing factors were identified. Additional studies are needed to determine whether supportive measures for these factors are useful in enhancing treatment motivation of cancer survivors.

Abbreviations

PS: performance status; OR: odds ratio; QOL: quality of life

Conflicts of Interest

The authors declare no conflict of interest regarding this study.

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